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THE EFFECTS OF ATTITUDE AND COMMITMENT ON RETENTION

by

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Dissertation submitted in partial fulfillment of
the requirements for the degree of Doctor
of Philosophy in the Department of
Psychology in the Graduate School
of Duke University

1975

A

ABSTRACT

(Psychology-General-Experimental)

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PhD
G348L
1976

ABSTRACT

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The literature pertaining to the effects of attitude on the learning and retention of controversial information was reviewed, and other variables which were thought to interact with attitude in its effect on memory were examined. No firm conclusions could be drawn because of the inconsistent results in past studies. The variable of commitment was singled out as a likely candidate for further study because of its possible crucial role in determining whether subjects would be open-minded in processing new information or whether they would react defensively to inconsistent material.

Using Kiesler's (1971) work as a point of departure, it was hypothesized that the higher the subject's degree of commitment to a stand, the more difficult it would be for him to retain inconsistent information as compared to consistent material. Furthermore, it was expected that this effect would grow in strength as the retention interval increased in length.

A final hypothesis predicted a positive correlation between the amount of inconsistent material retained and the degree of attitude change toward the position advocated in a counter-attitudinal speech.

An attempt was made to develop new ways of examining more than just the quantity of a subject's recall. Accordingly, objective measures were developed of the types and amount of distortion present in recall and of the importance of the ideas recalled.

The experimental design involved variation of three factors: degree of commitment (three levels), consistency of information with the subject's own position (two levels), and time of recall (two levels). Subjects were recruited from the Duke University subject pool, and a total of 120 subjects (10 per condition x 12 conditions) were used in the final analysis. Only subjects who indicated a stand definitely for or against capital punishment in a survey prior to the experiment were recruited.

Commitment was manipulated by varying the public nature of a speech which subjects thought they would have to tape-record. Subjects in both the high and low commitment condition were given their choice of reading a speech either supporting or opposing capital punishment. Any subject who did not pick the side corresponding to his pre-measured attitude was dropped from the experiment. High commitment subjects thought that the tape recording would be made public and they would be identified as the speaker, while low commitment subjects thought that they would remain anonymous. A control condition, or no commitment condition, was

created by offering some subjects the choice of reading one of two speeches unrelated to capital punishment.

All subjects heard a speech either for or against capital punishment which was either consistent or inconsistent with their own beliefs on the issue. Half the subjects were tested for recall immediately after hearing the speech, and the other half were tested only after a delay of one week. Measures were also taken of subjects' recall ability, the degree of commitment they felt, and their attitude change.

The results of the study showed that the commitment manipulation was executed successfully, but that none of the hypotheses were supported by the data. Higher degrees of commitment did not differentially affect subjects' recall of consistent and inconsistent information. Furthermore, the hypothesized positive relationship of attitude change to retention was rendered untenable because a significant correlation in the opposite direction was found. Two further hypotheses were developed to explain this negative correlation.

A significant interaction between degree of commitment and time of recall was obtained for the amount of material recalled. This complex interaction was interpreted as the result of a combination of different anxiety levels and different amounts of rehearsal between conditions.

Several small effects of dubious reliability involving the newly developed recall variables were found, but these findings need to be replicated because of the large number of significance tests conducted.

ACKNOWLEDGMENTS

I wish to express my deepest gratitude to my wife, Mary, who has stood behind me for five long years, offering me the encouragement without which I do not think I could have finished. She is someone I knew I could always depend on when I needed support and understanding.

I also wish to thank my advisor, Norman Guttman, for his support during the times when I was filled with self-doubt and for his constant effort to get me through graduate school. In fact, I owe a debt of gratitude to my entire committee, for they have been very supportive of my work.

I wish to thank the friends who have helped me keep some perspective on this whole affair and who have reinforced the idea that it is actually possible to finish a dissertation.

Last, but not least, I want to thank Edna Bissette for her excellent typing and numerous corrections of my manuscript and for her tolerance of my always being behind schedule.

J. M. G.

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INTRODUCTION

Do learning and retention of verbal information depend only on cognitive skills and cognitive variables or are these processes also systematically affected by one's attitudes and motivations? Many researchers have studied this question but have approached it from quite different points of view.

Memory for pleasant versus unpleasant material

A large volume of research has been inspired by Freud's (1914) theories of normal, everyday forgetting. Researchers in this area have attempted to find out if material perceived as unpleasant by the subject is forgotten faster (presumably by means of repression) than pleasant information. Unfortunately, many issues have been raised by this research while few firm conclusions have been reached. Many researchers have been criticized for using unrealistic situations and faulty derivations from Freud's theories (see Rapaport, 1971). Gilbert (1938), in an early review of the literature, was able to conclude, however, that if the study is done well and if recall is tested over a long enough period, pleasant information is remembered slightly better than

unpleasant, and the amount of recall is also related to the intensity of feeling independent of direction (i.e., greater pleasant or unpleasant feeling leads to better recall). Weiner (1966), in a later review, expresses similar but even more tentative conclusions based on a mixture of positive and null results in the studies he reviews.

The schema and recall

Using a different approach, Bartlett (1932) intensively studied subjects' reproductions of short stories (200-500 words) with retention intervals of minutes, hours, and even years. He observed that subjects quickly forgot irrelevant details, changed the style of the narrative to a more familiar one, and even added details to make more sense of the story. Bartlett concluded that subjects reconstructed a version of the story guided by an "attitude" toward the material and based on both present knowledge and some fragments of specific detail. It was Bartlett's view that, when people processed verbal information, they assimilated the information into their current knowledge. He used the word "schema" to describe parts of this knowledge structure, saying that a schema represents the active organization of past responses. In this organization, detail about the specific time and nature of past responses is easily lost, leading to distortion in reproduction of past events. The guiding framework for the reconstruction effort is derived from an attitude, which Bartlett vaguely defined as a complex psychological state people

feel at the time of recall or an emotional-affective tendency which provides the set for remembering. Thus, for Bartlett, remembering is best characterized as active reconstruction guided by an attitude and based on the present form of the schema.

Obviously, Bartlett's notion of attitude is quite different from the pleasant-unpleasant dimension investigated in the line of research stemming from psychoanalytic theory. In the latter, the pleasant-unpleasantness of the material is related to its probability of being recalled, while for Bartlett the attitude toward the material determines the particular form and style of the recall. Neither of these lines of research will be pursued further in this paper except for occasional reference; instead, a third line of investigation which uses yet another notion of attitude will be more closely examined as a background for the present research effort.

Social attitudes and memory

This line of research grew out of the early work in the theory and measurement of social attitudes. The meaning of attitude in this context corresponds more closely to the present use of the word, and a good working definition is summarized in Thurstone's (1931) words:

> "Attitude is the affect for or against a psychological object." Affect in its primitive form is described as appetition or aversion. Appetition is the positive form of affect which in more sophisticated situations appears as liking the psychological object, defending it, favoring it in various ways. Aversion is the negative form of affect which is described as hating the psychological object, disliking it,

> destroying it, or otherwise reacting against it. Attitude is here used to describe "potential action" toward the object with regard only to the question whether the potential action will be favorable or unfavorable toward the object. . . . The affect about an object may be of strong intensity or it may be weak. The positive and negative affect therefore constitutes a linear continuum with a neutral point or zone and two opposite directions, one positive and the other negative. (p. 261)

Researchers using this concept of attitude have sought to find out to what extent one's attitude on an issue affects the retention of information which supports one side or the other of the issue.

There are really two basic questions to be answered by a systematic investigation of this area. One is under what conditions and in what ways will attitudes influence memory? The second question asks what is the nature or mechanism of the influence process, i.e., what stages of information processing are affected by one's attitudes? The former question has received most of the research attention to date and will be examined first.

Relationship of attitude to recall

The earliest investigators proposed a simple, straightforward effect of attitude on memory, predicting that information that conflicts with or is in opposition to the point of view the subject expresses will be learned more slowly and/or forgotten more quickly than information with which the subject agrees. Watson and Hartman (1939) found only a trend toward better immediate recall of arguments consistent with subjects' positions on the existence of God (difference not significant) but did find

some evidence that subjects reshaped conflicting material to make it less effective by distorting it in recall. Using retention intervals ranging from 15 minutes to 4 weeks, Clark (1940) again found a tendency toward qualitatively different recall of counter-attitudinal material. Edwards (1941) used a true-false test to assess the amount of information subjects retained and found that subjects scored higher on items favorable to their own positions both on immediate recall and after 21 days. He also found a trend towards an increasing difference over time between favorable and unfavorable material, but the difference was not significant. In an often cited study, Levine and Murphy (1943) had subjects learn pro- and anti-communist material over a period of 5 weeks while testing their recall, and they then continued recall testing without learning for an additional 5 weeks. They found that information inconsistent with the subject's stand was recalled less well than consistent information at each retention interval and that the recall difference between consistent and inconsistent information increased slightly but steadily as the retention interval increased. Unfortunately, Levine and Murphy report no statistical tests of the differences between groups. Alper and Korchin (1952) found that, when males and females were asked to remember the material in a letter that contained statements both for and against males and females, males retained more pro-female, pro-male, and anti-female statements with females showing better retention only for anti-male material. These results are quite hard to interpret

since no measure of subjects' attitudes toward males and females was taken in the study. In a follow-up to Alper and Korchin's study, Taft (1954) tested blacks' and whites' recall of a passage which contained information favorable or unfavorable to blacks. They found that blacks recalled more of the favorable material than whites both immediately and after a 3-day delay. In addition, whites forgot the favorable information faster than blacks, while blacks forgot the unfavorable information faster. Doob (1953) found that subjects were able to recall material better in controversial passages when they agreed with it than when they disagreed with it. However, this effect was found only for the correctness of recall and not for the quantity of recall.

Thus, there is some evidence of differential recall of material which favors or opposes the subject's stand on the issue, but much of the evidence is weak and qualified. In addition, other investigators have failed to find any such direct effect of attitude on memory. Greenwald and Sakumura (1967) found no relationship between subjects' agreement with the material and their immediate recall of it. Using the issue of integration, Brigham and Cook (1969) failed to replicate Levine and Murphy (1943). Similarly, Smith and Jamieson (1972) did not find any effect of attitude on a variety of recall measures (immediate recall, delayed recall, speed of learning, and speed of relearning).

Faced with such mixed results, other investigators have proposed that attitude interacts with other variables producing a more complex

effect on learning and memory. Some candidates for these interacting variables have been:

1. The subject's ego involvement in the issue
2. The usefulness of the information
3. The plausibility of the arguments
4. The familiarity of the material
5. The intensity of the affect aroused by the information
6. The subject's set at the time of learning
7. The amount of dissonance aroused by the material
8. The degree of the subject's commitment to a stand on the issue

Each of these variables is briefly examined in the following sections in terms of the nature of the proposed effect and the evidence for it.

Ego involvement. Wallen (1942) proposed that subjects must have some degree of ego involvement with the material before attitudes will systematically affect retention. In his experiment, subjects learned and recalled bogus check-lists of adjectives describing personality traits which they thought corresponded to other persons' ratings of them (high ego involvement condition) or of another person (low ego involvement condition). Wallen found subjects' recall of supposed ratings of themselves were distorted more toward their own self-ratings than their recall of the supposed ratings of another person. These differences appeared only on delayed recall (after 48 hours). However, recall was unrelated

to the desirability of the particular traits described by the adjectives, a result which makes the others difficult to interpret. For example, if a subject has a positive attitude toward himself, then one would anticipate that he would distort the other person's ratings of him in the direction of more desirable ratings; instead, the distortion found was in the direction of increased correspondence with the subject's self-ratings without regard to desirability. This finding could be simply explained in another way if one assumes that, having forgotten the correct response, subjects are more likely to respond with their own self-rating when the recall relates to ratings of them than when it relates to ratings of another person.

Smith and Jamieson (1972) also measured ego involvement but found only that more ego-involved subjects remembered controversial statements better as a whole. Subjects did not show any differences in their recall as a function of the position of the statements in relation to their own views.

Usefulness of the information. Jones and Aneshansel (1956) argued that the perceived usefulness of the information presented to subjects could eliminate the effects of attitude. In line with this prediction, they found that pro-segregation subjects learned anti-segregation arguments as well as (and, in fact, even better than) anti-segregation subjects when they thought the arguments would be useful to know at a later time. When the subjects were given no information on the future use of the arguments,

the opposite result was obtained, with anti-segregation subjects learning the arguments better than pros. Jones and Aneshansel measured only immediate retention, so it is not clear whether these results hold up over a longer time interval and whether or not they change after the information is no longer of use.

In a somewhat related study, Zimmerman and Bauer (1956) told subjects that they would have to give a speech about raising teachers' salaries to an audience which was either for or against the raise. They then showed subjects arguments for or against raises and tested their recall of these arguments immediately and after a delay of 1 week (the delayed recall occurred before the subjects were to give the speech). Zimmerman and Bauer found that subjects recalled the information better when it was in agreement with the supposed views of the intended audience even though it may have conflicted with their own views (half of the subjects were going to be teachers and so were probably for higher teacher salaries). This result occurred only on the delayed recall, and it could be interpreted as supportive of Jones and Aneshansel's hypothesis if one assumes that the information in agreement with the views of the intended audience was perceived as more useful to the subjects than information opposed to the views of the audience.

Plausibility of the arguments. Jones and Kohler (1958) found that subjects learned plausible arguments which supported their stand on segregation better than implausible arguments and vice versa for

plausible and implausible arguments taking a stand opposite from their own. Long-term retention of these arguments was not measured in the study. However, no support has been given to these results by other investigators. Watson and Hartman (1939) had subjects rate the effectiveness of the arguments they learned. Assuming that effectiveness is highly related to plausibility, one would predict from Jones and Kohler's results that effective arguments would be remembered better than ineffective ones if they supported the subject's position and vice versa if they did not. Watson and Hartman found that subjects recalled effective arguments better than ineffective ones regardless of the position they defended. Both Waly and Cook (1966) and Brigham and Cook (1969) failed to replicate Jones and Kohler's results. Waly and Cook found that the trend of the recall data was actually in the opposite direction from that predicted, while Brigham and Cook found that subjects learned implausible arguments better in all conditions.

Familiarity of the material. Fitzgerald and Ausubel (1963) hypothesized that subjects are often more familiar with arguments supporting their point of view than those opposing it. They also thought that this differential familiarity would make the supportive arguments easier to learn and remember than nonsupportive ones. They found some evidence for this hypothesis in their experiment when a trend in the data towards differential forgetting of supportive and nonsupportive information was eliminated by controlling for subjects' level of prior knowledge on the

subject. However, Greenwald and Sakumura (1967) found no significant positive correlation between subjects' familiarity with controversial material and their recall of it. In fact, they found a significant positive correlation between subjects' ratings of the novelty of the arguments and the amount of recall. Since novelty had a high negative correlation with familiarity in the study, this result represents a reversal of Fitzgerald and Ausubel's findings. To round out these results, Smith and Jamieson (1972) found that neither familiarity nor novelty was related to any of several recall measures used in their study (immediate recall, delayed recall, speed of learning, and speed of relearning).

Another problem with Fitzgerald and Ausubel's contention that familiarity is the principal variable in recalling controversial material is that they cannot explain results such as Jones and Aneshansel's (1956) where the manipulation in the experiment of another variable (in this case, usefulness) causes a reversal in the retention results.

Intensity of affect aroused. Doob (1953) found that the more intense the subjects' agreement or disagreement with the material in prose passages, the more material they recalled, independent of the direction of agreement. The recall test in his study occurred 2 days after incidental learning of the material.

Kanungo and Dutta (1966) found that subjects' ratings of the intensity of affect aroused by the material (adjectives describing subjects' own or another caste system) varied with the relation of the material to

the subjects' attitudes; they argued that intensity, not attitude, explained the recall differences they found between information consistent and inconsistent with subjects' attitudes. In a follow-up experiment (Dutta, Kanungo, & Freibergs, 1972), similar results were found. However, the data do not justify the conclusions reached by the authors. They reason that attitude toward the material relates to the intensity of affect aroused by the material and that intensity in turn affects the retention of the material. It is just as likely that attitude toward the material affects both the perceived intensity and the recall of the material directly without a causal chain linking the three together. The results of the studies show that information consistent with subjects' attitudes is recalled better than inconsistent information and that consistent information is rated as more intense than inconsistent. The inference from these data that increased intensity of affect leads to increased recall is not justified.

Smith and Jamieson (1972) also measured intensity of affect aroused by the material but found no relation between subjects' ratings and the learning or recall of the material.

Set at time of learning. Malpass (1969) suggested that the crucial variable in the retention process for controversial material is the set established by the instructions to the subject at the time of learning. He thought that attitude would have a larger effect on retention if subjects were not given instructions to learn the material since he theorized that attitude effects are mediated by selective attention (which might be

eliminated by these instructions). Subjects in his experiment were given one of three possible instructions, either (a) to consider the essay in relation to their own opinions, (b) to rate the essay for clarity, or (c) to learn the essay. Malpass found recall differences between consistent and inconsistent information only when subjects were instructed that they were doing a rating task.

A review of other studies provides no further support for Malpass' hypothesis. Only two of the four studies that used incidental recall (no intentional learning) and that had interpretable results found effects of attitude on memory, i.e., Watson and Hartman (1939) and Clark (1940) had positive results while Greenwald and Sakumura (1967) and Smith and Jamieson (1972) had null results. On the other hand, three of the six studies in which intentional learning instructions were given had positive results (Edwards, 1941; Levine & Murphy, 1943; Taft, 1954; versus Brigham & Cook, 1969; Fitzgerald & Ausubel, 1963; Smith & Jamieson, 1972).

Dissonance aroused by information. Dissonance theorists have frequently mentioned forgetting of dissonant information as a possible mode of dissonance reduction (Brehm & Cohen, 1962; Festinger, 1957, 1964; Hardyck & Kardush, 1968). Under most conceivable circumstances, information that conflicts with a subject's stand on an issue would be more likely to arouse dissonance than information compatible with his stand and so would be more likely to be forgotten. However, dissonance

arousal is predicted under these circumstances only when subjects are in a post-decisional phase, e.g., when subjects have taken a definite stand on the issue (Festinger, 1964). Also, forgetting is only one mode of dissonance reduction; alternatively, subjects could bolster their own position by adding supportive cognitions, misperceive the information, or somehow invalidate the information (Festinger, 1957). Therefore, it is quite difficult to predict whether in a given experimental situation subjects will reduce dissonance by forgetting counter-attitudinal information, thus making it hard to prove or disprove hypotheses about forgetting based on dissonance arousal.

Only a few studies have directly examined the forgetting of dissonant information. Brehm and Cohen (1962) report an experiment by Brehm on the recall of dissonance-arousing information. In this study Brehm hypothesizes that dissonant information may initially be more "salient" to subjects than nondiscrepant information, and this salience effect will show up as better initial recall of the dissonance-arousing information. However, as the time interval between dissonance arousal and recall increases, the initial salience effect should disappear and nondiscrepant information should be favored in recall. Brehm had subjects rate themselves, their favorite TV star, a friend, and the friend's favorite TV star on a list of personality traits and then exposed them to "phony" ratings supposedly made by the friend either of themselves (high importance condition) or their favorite TV star (low importance condition).

Subjects were given time to compare their friend's rating sheet with their own and to commit it to memory. They were asked to recall their friend's ratings both immediately after studying them and after a delay of 1 week. As predicted, the immediate recall data showed that subjects recalled the ratings better when they were discrepant with their own than when they were nondiscrepant. This difference appeared only in the high importance condition, a result compatible with a dissonance interpretation since a greater amount of dissonance is aroused when the discrepant information is more important. The delayed recall data showed that, as expected, subjects remembered significantly less discrepant information than nondiscrepant, but this time there was no difference in the rate of forgetting between the high and low importance conditions, casting some doubt on the dissonance interpretation.

An alternative explanation of Brehm's results can be given without invoking a dissonance interpretation. Since the amount of time subjects spent studying each rating was not controlled, it seems fair to assume that they spent more time studying discrepant ratings than the nondiscrepant ones especially when the ratings were thought to apply to themselves, a situation which would lead to better immediate recall of the discrepant ratings. However, delayed recall may have been more affected by the difficulty of recalling their friends' ratings when they were discrepant with their own. There are two pieces of information to be remembered for discrepant ratings and only one for nondiscrepant.

In the discrepant case, one must remember the following: (a) "my friend rated that trait differently than I did" and (b) "my friend made this specific choice" (there were four possible choices on the rating scale for each trait); in the nondiscrepant case, it is sufficient to remember the following: "my friend rated that trait the same as I did so all I need to do is mark it the same way I did before."

Jecker (1964) also looked at recall as a function of the dissonance aroused by the information. Jecker gave each subject free access to information which was either favorable or unfavorable to two other people, one of whom the subject was to choose as his partner in a competitive task to be played later in the experiment. Jecker found that subjects recalled more information supportive of their decision as to who would be their partner than information nonsupportive of their decision. This result was obtained regardless of whether the information had been given to subjects before selecting their partner or given to them after the selection was made. Subjects who had made a tentative choice but were still uncertain as to who would be their partner at the time they were asked to recall the information showed no differences in the recall of supportive versus nonsupportive information. In all conditions, recall was tested shortly after subjects were exposed to the information but after they had chosen their partner. This result is in line with Festinger's notion that dissonance is aroused only in a post-decisional phase since the nonsupportive information should not be as dissonance arousing for

the uncertain subjects, and indeed they did not show differential recall of it. The results of Jecker's study are the reverse of some of Brehm's since Brehm found initial salience (in terms of better recall) of discrepant information while Jecker found better initial recall of the information supporting subjects' decisions.

These two studies depart somewhat from the typical studies looked at in this section since they do not directly examine the recall of information relating to subjects' attitudes toward a particular issue. To the present experimenter's knowledge, no studies have been done from a dissonance-arousal point of view which looked at the recall of information conflicting with a subject's attitude toward a controversial issue. However, the inference is clear from the studies reported above and from dissonance theory that counter-attitudinal information should arouse dissonance in proportion to the importance of the issue and the degree to which the subject feels he has taken a stand on the issue. It is also clear that dissonance-arousing material should be forgotten faster than supportive information over a relatively long time interval, but the prediction for immediate recall is not at all clear since Brehm predicts and finds one thing while Jecker finds the opposite.

Degree of commitment. Kiesler (1971) defines commitment as the "'pledging or binding of the individual to behavioral acts'" (p. 30). According to Kiesler, commitment can be increased by increasing any of the following:

1. The public nature of the committing act
2. The importance of the act
3. The irrevocability of the act
4. The number of consistent acts performed
5. The perceived freedom of choice in performing the act

For instance, someone who made a speech before thousands of people taking a strong stand for capital punishment would be more committed to that stand than someone who merely mentioned to his wife that he thought it would be a good idea to have capital punishment. Kiesler hypothesizes that, as commitment increases, a person's resistance to attitude and behavior change increases. He states that this process may occur because commitment to a position "makes salient to the individual those cognitions related to his attitudes" (p. 109). The increased availability of these cognitions increases the individual's resistance to attack either directly by allowing him to refute arguments against his position or indirectly by organizing a consistent cognitive structure which makes it harder to assimilate inconsistent material. It is this latter case that is of interest in the present paper because the reasoning involved led Kiesler to predict that the more committed someone is, the harder it would be to learn and remember information inconsistent with his stand on the issue (as opposed to the retention of consistent information).

Salancik and Kiesler (1971) looked at the effect of subjects' public commitment on their retention of related word-pairs. In both high and

low commitment conditions, subjects tape-recorded a prepared speech which was consistent with their own views on the subject of having civilian review boards to monitor the police. The commitment manipulation was introduced by telling the subjects that, when the tapes were played in a classroom setting for demonstration purposes, either the audience would be able to identify them (high commitment condition) or the subjects would be completely anonymous (low commitment). After making the tape, subjects learned paired associates which Salancik and Kiesler claim were either consistent or inconsistent with a subject's position on the issue. For example, "victim-critic" is a pair consistent with a pro-civilian review board stance and "defiance-damage" is a pair inconsistent with this stance. However, the consistent-inconsistent relation of these word pairs to a subject's stand on the issue is quite difficult to perceive and to understand in the present experimenter's opinion. Salancik and Kiesler found that, after three learning trials, high commitment subjects recalled more consistent than inconsistent word-pairs while low commitment subjects recalled more inconsistent than consistent pairs, thus confirming their prediction. No data were gathered on long-term retention of the word-pairs.

In a related study, Kleck and Wheaton (1967) examined both subjects' dogmatism and commitment. These investigators supposed that open- and closed-mindedness as measured by Rokeach's Dogmatism Scale are closely related to the concept of commitment since both

concepts involve resistance to change. In this study dogmatism was pre-measured and commitment was manipulated by having half the subjects voice their opinions in front of the experimenter (committed condition) versus having half the subjects make no statement on their position to the experimenter (noncommitted condition). Subjects read pro and con articles on the driving age issue and after 1 week took a multiple choice test to measure their retention of the article. The expected interaction between level of commitment and consistency of the article with subjects' positions was not obtained. However, there was a significant interaction between dogmatism and consistency in which low dogmatics retained consistent and inconsistent material equally well, while high dogmatics showed a decrement in the retention of inconsistent information. Kleck and Wheaton expressed disappointment at the lack of a commitment effect and proposed that their commitment manipulation was too weak. Unfortunately, no manipulation checks were taken in the study to help one decide whether the commitment manipulation was of adequate strength to create differences between conditions.

Stages of information processing affected by attitudes

As one might assume from the rather inconsistent results just summarized, little attention has been paid to finding out what stages of information processing are affected by subjects' attitudes. Of course, the reason for this lack of attention has been the paucity of any reproducible,

reliable effects with which to work. It is difficult to plan more detailed and elaborate experiments to localize an effect without knowing from one experiment to the next whether there will even be an effect to study.

The studies summarized do not make an organized effort to separate out the differences between attention, initial learning, and long-term retention. Experimenters often presented subjects with information that alternately defended one side or the other of the issue and then allowed subjects to pace themselves in learning the material (e.g., Alper & Korchin, 1952; Clark, 1940; Edwards, 1941; Greenwald & Sakumura, 1967; Jones & Kohler, 1958; Smith & Jamieson, 1972; Taft, 1954; Waly & Cook, 1966; Watson & Hartman, 1939). In this situation subjects might pay more attention to or put more effort into learning one side of the issue than the other. If the experimenter wanted to exert more control over attention, it would be much better to expose subjects to information on one side or the other of the issue exclusively and to have the flow of information paced by the experimenter, e.g., by having subjects listen to a tape-recorded presentation.

Similarly, experimenters have typically not effectively separated initial learning effects from long-term retention. Sometimes they measured subjects' recall only immediately after exposure to the material (Greenwald & Sakumura, 1967; Jecker, 1964; Jones & Aneshansel, 1956; Jones & Kohler, 1958; Waly & Cook, 1966; Watson & Hartman, 1939); sometimes only after a delay of several days (e.g., Doob, 1953; Kleck &

Wheaton, 1967); and other times they measured the same subject repeatedly (e.g., Alper & Korchin, 1952; Brehm & Cohen, 1962; Brigham & Cook, 1969; Clark, 1940; Edwards, 1941; Levine & Murphy, 1943; Malpass, 1969; Smith & Jamieson, 1972; Taft, 1954; Zimmerman & Bauer, 1956). The best procedure for identifying differences between short-term learning and long-term recall would be to test one group of subjects immediately after learning and independent groups at various retention intervals. Repeated testing of the same subject is undesirable both because each recall provides additional practice which makes later recall better and more stable and because what subjects recall after repeated testing is likely to be the material in their previous recall rather than the original material.

Hypotheses

It is difficult to draw any firm conclusions about the effects of attitude on learning and memory from the preceding review of the literature because of the generally inconsistent results. The following tentative conclusions could be made based on the findings to date:

1. The perceived usefulness of the material can affect its retention over and above the effect of attitudes.
2. The intensity of affect aroused by the material is correlated with its retention, but whether intensity is a product of attitude or is independent of it is not clear.

3. Some degree of commitment to a stand on the issue may be necessary for attitude to affect retention (this effect is parallel to the dissonance theorists' distinction between pre- and post-decisional processes); however, there is not enough evidence to decide the issue at this point.
4. The importance of the issue may determine whether counter-attitudinal information will arouse dissonance or not (the higher the importance, the more the dissonance aroused) and, therefore, determine when attitude will affect memory, but again there is not enough evidence to decide.
5. The other variables examined (i.e., ego involvement, plausibility of the arguments, familiarity of the material, learning set) have produced such mixed and inconsistent effects on the retention of pro- and counter-attitudinal material that it is probable that they have no systematic relationship to retention of this material.

The study proposed in this and the following sections represents an attempt to shed more light on the relationship of commitment to the retention of controversial material.

There are several converging lines of thought which indicate that commitment is an important variable to examine. Festinger (1964) stated that the pre-decisional phase (which corresponds to an absence of commitment) is characterized by objective information gathering, and it

is only after making a decision (a state corresponding to a higher degree of commitment) that dissonance is aroused and efforts are directed toward reducing it. Jones and Gerard (1967) discuss the "'basic antinomy' between openness to change and the desire to preserve a pre-existing view or conviction" (p. 227). From their point of view, it is advantageous to be flexible in some circumstances and inflexible in others. Jones and Gerard suggest that openness and flexibility are characteristic of the pre-decisional phase and that self-protection and stability are more characteristic of the post-decisional phase. Adding support to these notions, Kiesler (1971) argues that the higher the commitment, the more resistance to change people show, perhaps because they are less open to opposing information.

Thus, it may be the case that only measuring a subject's attitude toward an issue does not provide enough information to predict whether his attitude will affect his retention of information about the issue. Even though the subject may indicate a strong opinion on the issue, he may be relatively uncommitted to his stand and therefore be open to information defending either side of the issue. It stands to reason that, before taking a stand or making a binding decision, people are open to information on all sides of the issue since it is to their advantage to process all relevant information in order to make the most adaptive decisions. However, once someone is highly committed to a position on the issue because of past decisions and actions, it is no longer so important to process information

objectively, and, in fact, it may be conflict arousing to retain information that casts some doubt on the position one has taken.

Although the distinction between pre-decisional and post-decisional processes on the one hand and degree of commitment on the other refer to similar concepts and processes, it is desirable to think of the process in terms of a continuous variable rather than a dichotomous one. People usually do not suddenly change from being totally uncommitted to completely committed but rather gradually build up a commitment through a series of consistent decisions and actions. Kiesler's (1971) concept of commitment does refer to a continuous variable which is affected by the explicitness, importance, and irrevocability of the act, the number of acts performed, and the degree of choice in performing the act. His definition of commitment is used in the remainder of this paper in preference to a simple distinction between pre- and post-decision processes.

The first hypothesis to be tested in this study follows directly from the results found by Salancik and Kiesler (1971) and is stated as follows:

> Hypothesis 1: The more committed subjects are to a particular stand on an issue, the less information they will remember which is inconsistent with their position as compared with the amount of consistent information remembered. Relatively uncommitted subjects may show no differences in the retention of the two types of material.

Since Salancik and Kiesler's results supporting Hypothesis 1 were

obtained using recall data taken immediately after three learning trials, whatever process is involved in the differential retention must occur during the early stages of information processing. However, Salancik and Kiesler exerted some control over attention by presenting the word-pairs for a fixed period of time on a memory drum. Also, they did not find differences across conditions on the learning of the word-pairs on any of the three learning trials (measured by cued recall). Given these results, it appears that the differences are either in the rate of decay of the information or the difficulty of retrieving the information. This reasoning leads to the following hypothesis:

> Hypothesis 2: The recall differences discussed in Hypothesis 1 may or may not show up on an immediate recall test depending on whether or not there has been a sufficient time interval to allow for differential forgetting. However, these recall differences should be found on a delayed recall test. If there are differences on immediate recall, these same differences should be observed in delayed recall, and, in fact, the differences should be even larger on the delayed recall test.

Most studies have looked at only one aspect of retention, namely, the amount or quantity of information recalled by the subjects. It is reasonable to assume that people can resolve the conflict generated by inconsistent information in other ways than by completely forgetting it. For example, people may distort the material so that it is easier to

accept or easier to reject, or they may selectively recall those ideas which are less threatening. Measuring only the quantity of recall does not give a complete picture of what differences may exist between groups in the recall of the material. Therefore, this study examines the following aspects of recall in addition to the more traditional measures of the amount recalled:

1. The amount of distortion in recall which has the effect of making the recalled material closer to the subject's own position on the issue than was the original material
2. The amount of distortion in recall which has the effect of making the recalled material further away from the subject's own position than was the original material
3. The average importance to the overall effectiveness of the passage of the ideas that the subject recalls

The first aspect of recall mentioned above (distortion of the material toward one's own position) examines the possibility that subjects distort the material in such a way that it is easier for them to accept. The second aspect (distortion of the material away from one's own position) looks at the opposite effect, i.e., that subjects distort the material in a way that makes it so radical that it is easier to reject. Both of these possibilities can be measured using a single scale on which the rated distortion of the recalled material can range from more radical than the original to less radical than the original. The third aspect of recall

mentioned above (the importance of the ideas recalled) looks at the possibility that subjects may selectively recall only the less important ideas and thereby dilute the impact of the message.

Thus, the relation between commitment and recall is examined using different types of recall measures. There are several possibilities to explore other than the one postulated in Hypothesis 1 for the quantity of recall:

1. More committed subjects may distort inconsistent ideas toward their own position to a greater extent than less committed subjects.
2. More committed subjects may distort inconsistent ideas away from their own position to a greater extent than less committed subjects.
3. Since it is possible that subjects are not consistent in their distortion and both distort some ideas away from their own position and some ideas toward their own position, more committed subjects may show a greater range of distortion in both directions than do less committed subjects.
4. More committed subjects may recall fewer inconsistent ideas of importance than less committed subjects.

One problem that arises in any measurement of recall of text is how to define the unit of measurement. Units have been defined in the literature ranging in length from individual words to entire sentences.

For the purposes of this study, sentences were chosen as the unit of measurement. Complete sentences are the logical candidates for units of measurement because they define a complete unit of expression containing both a subject and a predicate. Also, there is evidence suggesting that a complete sentence is regarded as a single unit or "chunk" of information when subjects process connected verbal text (see Jarvella, 1971).

The final hypothesis to be tested in the study concerns the relationship between attitude change and retention. Kiesler (1971) theorizes that commitment increases resistance to attack by organizing the cognitions related to the subject's attitude into a consistent cognitive structure which makes it more difficult to assimilate inconsistent material. Since increased resistance to attack means less attitude change and reduced assimilation of material means less of it available for recall, this reasoning leads to the following hypothesis:

> Hypothesis 3: The degree of attitude change toward the position advocated in a counter-attitudinal communication should be significantly and positively correlated with the amount of inconsistent material recalled at the time of the post-measure of attitude.

Design of study

The study designed to test these hypotheses includes three factors--

degree of commitment, consistency of the information with a subject's position, and time of recall. The factor of degree of commitment has three levels--high, low, and no commitment. The manipulation of commitment involves varying the public nature of a tape recording that subjects believe they will make later in the experiment. In line with Kiesler's notion that increasing the public nature of the act increases the amount of commitment (Kiesler, 1971), high commitment subjects are led to believe that their tape-recorded speeches defending one side or the other of the issue will be made public, while low commitment subjects are led to believe the recordings will be private. Of course, these two levels of commitment cover only a very small part of the total possible range of commitment but hopefully represent a large enough separation to differentiate between conditions. The no commitment condition is included as a control condition in which subjects will take no stand at all on the issue in the experimental setting. By comparing results in this condition with the other two, it is possible to ascertain to what degree just making a decision on the issue is important as compared to the public nature of that decision.

The factor of consistency has two levels--either the information presented to subjects in the form of a tape-recorded speech advocates the same side of the issue the subject supports (consistent condition) or advocates the opposite side (inconsistent condition).

Finally, the time of recall is either immediate (within a few

minutes of hearing the speech) or delayed (1 week after the speech). The time interval of 1 week for delayed recall was chosen as a matter of convenience and is arbitrary. Independent groups are tested in the immediate and delayed recall conditions for reasons already mentioned. However, since those subjects who recall the speech immediately have to come back the following week, it was decided to retest them, obtaining a delayed recall measure which represents a second measure of retention. This repeated measurement allows a comparison between the nonrepeated (independent groups) and repeated measure (test-retest) methods in terms of the results shown by each measurement method. The three-factor design is summarized in Figure 1.

		Time of Recall			
		Immediate		Delayed	
		Consistency of Information			
		Consistent	Inconsistent	Consistent	Inconsistent
Degree of Commitment	High				
	Low				
	No				

Fig. 1. Design of study.

Since subjects are comprised of an equal number of people for and against capital punishment, a subject's position on the issue (pro or con) could be considered as a fourth factor if needed for interpretation or clarification of results.

Other variables are represented in the study at a fixed level. The experiment is structured to equalize the usefulness of the information that subjects receive in all conditions by avoiding instructions which would lead subjects in one condition to think that the information was more useful than did subjects in the other conditions. The issue chosen for the experiment, capital punishment, is a very controversial issue at present and is likely to be considered very important by the subjects, thus fixing importance at a relatively high level. Finally, the subjects are not expecting to recall the speech they hear, and, therefore, the study examines incidental learning.

The main dependent variables in the study are different measures of subjects' recall of the information in a controversial speech. Measurements are included of the quantity of material recalled, the amount of distortion introduced in recall, and the relative importance of the ideas recalled. The amount of attitude change as a function of conditions is also determined by obtaining pre-experiment and post-experiment measures of attitude. To attempt to eliminate some of the variance due to individual differences in general recall ability, measurements were taken of each subject's recall of a "neutral" passage (nonvalue laden)

and are used as covariates in the analysis of the other dependent measures when appropriate.

METHOD

Subjects

Subjects for the experiment were selected from the fall, 1974, and spring, 1975, subject pools of the Psychology Department at Duke University. The subject pool at Duke is made up of students taking their first psychology course. A total of 144 subjects completed the experiment, but, due to several factors which will be discussed later, only 120 were acceptable for inclusion in the analysis.

Subjects were selected for participation in the experiment on the basis of their scores on a survey of attitude toward capital punishment. This survey was filled out by the potential subjects during a group testing session which precedes the start of each semester's experiments. This pre-measure used a Likert-type scale and contained 4 items relating to capital punishment, embedded in a form containing a total of 32 items (see Appendix A for a copy of the attitude questionnaire).

Each capital punishment item was scored from -5 points to +5 points with minus reflecting positions against capital punishment and plus representing positions favoring capital punishment (neutral point equals 0). The sum of these four items was computed for each potential

subject giving him or her a total score ranging from -20 to +20. Only those subjects who were decidedly for or against capital punishment could be included in the experiment because of the necessity of assigning them to hear speeches which either conflicted with or supported their positions. Therefore, cutoff points were established on the -20 to +20 scale with +10 to +20 defined as the "pro" group and -10 to -20 defined as the "con" group. Capital punishment is apparently a controversial issue among the groups tested because potential subjects' scores were distributed fairly evenly along the entire scale. Thus, the pro and con groups each represented about one-fourth of the subject pool with the other half scoring too close to neutral to be used in the experiment.

In the fall semester, subjects were recruited by posting sign-up sheets with a list of names of those allowed to sign up. The posting of restricted name lists is fairly common practice and does not usually arouse subjects' suspicions. Those who did inquire about the reasons for their inclusion on the list were told that it was a randomized list of names drawn from those who participated in the group pretesting session. This explanation invariably satisfied them.

Since only a relatively few subjects were needed in spring semester and time was a factor, subjects were recruited in the spring by telephoning them and requesting their participation. This time they were specifically told that they were selected by a randomization procedure designed to get a good cross-section of people into the experiment. Calling

subjects on the phone is a common method of recruitment and again the explanation of the call satisfied their curiosity.

Twenty-four of the subjects who participated in the experiment had to be eliminated from the analysis for a variety of reasons. The reason for most of the subject loss was that some of the subjects took a stand in the experiment which was inconsistent with their pre-measured beliefs, i.e. they chose to make a speech which was on the opposite side of the issue from their pre-measured stand. This switch of positions accounts for the loss of 15 subjects. The number per condition is summarized in Table 1. It is clear that this type of loss potentially poses an interpretation problem in the experimental results. The loss was due to pro subjects switching to a con position with only one exception, and the number lost is clearly a function of the commitment manipulation. However, since this loss poses an interpretation problem only for the pro subjects, any results obtained may be examined with pro-con as a factor to see if cons reacted the same as pros. This problem will be discussed further in the Results and Discussion sections.

Table 1

Number of Subjects Lost Due to Switching Positions

Position of Subject	Degree of Commitment		
	High	Low	No
Pro	8	6	0
Con	0	1	0

The other major reason for subject loss was failure of subjects to appear for the second session or appearing late. Table 2 summarizes the number of losses for this reason. Since the losses were minor and are fairly evenly distributed over conditions, no interpretation problem is posed by the loss of these subjects.

Table 2

Number of Subjects Lost Due to Failure to Appear for Second Session

Position of Subject	Degree of Commitment		
	High	Low	No
Pro	1	1	0
Con	3	1	2

There was only one other subject eliminated from the experiment, a pro subject in the high commitment condition who refused to make a tape recording (the committing act).

Materials

Pre-measures and post-measures of subjects' attitudes were taken using the survey forms in Appendix A and Appendix J, respectively. Each scale contains the same four items to measure attitude towards capital punishment. These four opinion statements were selected from longer scales included in Shaw and Wright (1967). Four items were used

in order to increase the reliability over that possible with one or two items. More than four would have made it difficult to embed these items in a longer survey form containing several issues without drawing too much attention to the crucial issue. To avoid further making the capital punishment issue stand out, all other issues included on the form were also measured with four opinion statements. The filler items for the pre-measure survey were taken from scales in Shaw and Wright (1967). The filler items for the post-measure survey were made up by the experimenter, and different filler items were used in the two forms to try to minimize the association between the two in subjects' minds.

Each of the four capital punishment statements were scored on a scale from -5 to +5 ranging from extreme "con" to extreme "pro" as discussed in the previous section. Since subjects responded very consistently to these four statements in the group testing sessions, all four items were used to arrive at a total score. From the results of group testing it was felt that this total score was the most sensitive and reliable indication available of subjects' attitude toward capital punishment.

Two speeches (Appendix D and Appendix E) were written by the experimenter to present information to the subjects either favoring (pro) or opposing (con) capital punishment. An effort was made to make the speeches as similar as possible in terms of length, types of arguments used, and style of presentation. The pro speech contains 407 words and 22 sentences while the con speech has 405 words and 23 sentences. A

tape recording was made of each speech by a graduate student who attempted to read both speeches in the same tone and manner. The speeches used a mixture of factual material and emotional arguments to develop their case. The facts were somewhat distorted in each so that the speeches could be biased in the appropriate directions. The main distortions occurred in reference to statistics showing the deterrent value of capital punishment, the number of states having capital punishment laws, and the likelihood of murderers being reformed. It was thought that some of the arguments in the speeches would be familiar to most of the subjects but that they would not have the exact information needed to refute the statistics mentioned.

Another passage was constructed to get a rough measure of subjects' recall abilities, independent of the influence of strong attitudes. The passage which was used presents factual information on navigation by the stars (Appendix I). The material represents a modified version of a passage from a beginner's astronomy text (Bernhard, Bennet, & Rice, 1954). It was intended that the resulting material be as attitude bias free as possible, although admittedly subjects' interest in the material would vary somewhat. However, time restrictions eliminated the possibility of obtaining any but a single, rough measure of subjects' recall abilities. Recall of the "neutral" passage was intended as a measure of general recall ability for meaningful text.

A questionnaire was designed to test whether the different

manipulations to which subjects were exposed in the experiment were actually effective. This "manipulation check" form is reproduced in Appendix K. Question 1 on this form is merely a distractor item. Questions 2 and 3 are attempts to measure whether subjects correctly perceived the instructions they were given in the experiment and whether they believed them. Question 4 is designed to assess whether subjects felt that they were taking a "public stand" on the capital punishment issue during the experiment.

The possible responses for each question range from one which is interpreted as a rather strong public commitment to one which indicates essentially no feeling of commitment within the experimental setting. For each question the answers are ordered in the direction of increasingly less commitment, i.e. the first response represents the highest commitment. The four possible responses were scored 4, 3, 2, and 1 points, respectively, with a higher score on a particular question indicating a greater feeling of public commitment.

Procedure

Subjects were assigned in a random manner to receive one of the 12 possible treatments in the experiment. This assignment was done separately for subjects who favored capital punishment and for those who opposed it to assure that an equal number of each would be assigned to every cell and thus counterbalance any possible differences between the

two groups. It was decided that 10 subjects per cell (5 pro and 5 con) would be adequate for the analysis. The actual randomization procedure consisted of drawing slips of paper from a jar which contained 5 of each cell number or a total of 60 numbers (5 subjects x 12 cells) and replacing numbers when subjects did not show up or were dropped from the experiment. A separate set of numbers was used for pro and con subjects.

The experiment was divided into two 1/2-hour sessions, 1 week apart. The instructions to the subjects for the first session are in Appendix B and for the second session in Appendix H, and a summary of the order of events is given at the end of this section.

At the start of the first session, subjects were told that the purpose of the experiment was to study the judged effectiveness of different styles of presenting speeches on current issues. They were led to believe that capital punishment was chosen as an issue because of its controversial nature and that students were evenly divided on this issue. Subjects were informed that in the first session they would hear a tape-recorded speech about capital punishment and then be asked to judge various aspects of the speech. They were not expecting to have to recall the speech.

After the first session was briefly discussed with them, subjects were told that when they returned the following week they would be asked actually to make a tape recording. This recording was said to be

important to the experimenter because he needed to analyze some speeches where people used their own natural style of presentation. It was emphasized that the subjects would not have to prepare a speech; they would only have to read an already prepared transcript. This was stressed so that subjects would have no obvious reason to review and rehearse the issue in their minds during the intervening week.

Starting at this point the instructions differed depending upon which commitment condition subjects were assigned to. High commitment subjects were informed that they would be reading a speech either favoring or opposing capital punishment and that the tape recordings they made would be played in certain psychology classes as a demonstration. Subjects were told that they would be asked to give their name on the tape recording and that students who heard the tape would probably assume the position advocated in the speech was the subject's own. Subjects were then given their choice of reading a speech either for or against capital punishment.

Low commitment subjects were also given the choice of reading a speech either favoring or opposing capital punishment, but, in contrast, they were led to believe that the tapes they made would be used only for research and not be heard by people outside the laboratory setting. Furthermore, they were told that the tapes would be analyzed in such a manner that their voice would be distorted and essentially unrecognizable.

Thus everything in the high commitment procedure stressed the

public nature of the act and the fact that making the recording represented taking a public stand on capital punishment, while in the low commitment procedure the anonymity of the act was stressed and the importance of the decision was minimized. This method of manipulating commitment was felt to be a fair operationalization of Kiesler's (1971) conception of commitment and, in fact, closely corresponds to manipulations he has used and found effective.

The control group or no commitment group received the same instructions as the low commitment group except that the speeches they were offered a choice of reading were unrelated to capital punishment (either world food problems or the U.S. space program). Thus they made no decision related to where they stood on capital punishment in the experimental setting.

All subjects were asked to sign a consent form on which they agreed to make a tape recording and wrote in the position of the speech they would be reading (Appendix C). The form summarizes the experimental instructions and thus served to reinforce them. It was expected that the signing of this form would give subjects a stronger feeling of making a decision and being bound to it.

After the commitment manipulation the experimenter announced that he was ready to start the actual experiment and that he would leave the experimental room to play the tape-recorded speech on capital punishment from the "control room." Before the experimenter left the

room, he told subjects in the high and low commitment conditions that the speech they were about to hear was completely different than the one they would read the following week. Subjects then heard a brief recorded introduction in which they were told that the speech they were about to hear was originally made by a well-respected criminologist who had studied the capital punishment issue for several years. They were asked to pay close attention to the content of the tape because it would be important when they filled out the rating form. The subjects were led to believe that this introduction was "live" instead of recorded (it was recorded to standardize procedure as much as possible). After the introduction, the tape continued with either a speech favoring capital punishment or one opposing it. Subjects who were assigned to the inconsistent information condition heard the speech which was opposite to their own pre-measured position, while those assigned to the consistent information condition heard a speech which agreed with their position. When the speech ended, subjects were asked to listen closely to the same speech one more time, and the speech was replayed. Then the experimenter returned to the room and gave the subject a rating sheet containing several questions about the speech (Appendix F). The experimenter asked the subject to check the response on this form corresponding to his feelings about the speech and then left the room again while the form was completed. The experimenter returned and collected the form after 1 1/2 minutes (an amount of time which proved more than adequate for

subjects to finish in pretesting). The rating form was used to fulfill subjects' expectations about the experimental task but is not of further use in the study. As the final step in the first session, subjects who were assigned to the immediate recall condition were asked to recall the entire speech and were given the form in Appendix G which contains brief instructions for recall. The experimenter left the room during the recall and checked back with the subject periodically (after 10, 15, and 20 minutes) to see if he had finished. Subjects were encouraged not to feel pressured by time. Recall was terminated after 20 minutes by asking the subject to finish up what he was writing and then quit. Only a very few subjects needed as much as 20 minutes to complete their recall, and none of them appeared to feel that they were cut off from remembering much more when they were asked to stop.

Subjects assigned to the delayed recall condition were dismissed after they filled out the rating form and not asked for any sort of recall in the first session. Before subjects were dismissed from the first session, they agreed not to discuss the experiment with others.

One week later, at the start of the second session, subjects were again asked to fill out the speech rating form on the pretext that the experimenter wanted to know their opinions after a lapse of 1 week. The re-rating was used to provide a warm-up and context for recall of the speech. Immediately following filling out the rating form, subjects in all conditions were asked to recall the speech again using the form in

Appendix G.

The experimenter left the room during the recall period and checked back with the subject at 7, 10, and 15 minutes. Recall was terminated after 15 minutes if necessary. At this point subjects were told that it would not be necessary for them to make the tape recording they had been told about the previous week. They were requested instead to read some material and fill out additional forms for the experimenter. The experimenter then exposed them to the information in the "neutral" passage on the pretext that he was interested in their opinions about the material for use in other phases of the experiment (Appendix I). Subjects read through the passage and briefly discussed it with the experimenter. Next, subjects were asked to fill out an attitude survey (the post-measure of capital punishment attitudes, Appendix J) and then were asked to fill out the manipulation check form (Appendix K). The final task consisted of having subjects recall the neutral passage that they had read a few minutes earlier. The experimenter left the room during the recall and checked back after 5, 7, and 10 minutes, terminating recall if subjects were not finished after 10 minutes.

To close the experiment, subjects were completely debriefed and any questions they had were answered. Before they left they were again asked not to discuss the experiment with others.

Because of the complexity of the present study, the sequence of events is summarized below to help clarify the procedure. Subjects

experienced the following sequence:

A. Group testing
  1. Filled out pre-measure survey (Appendix A)

B. First session of experiment
  1. Heard introduction to experiment (Appendix B)
  2. Received either high, low, or no commitment manipulation (Appendix B)
  3. Signed consent form (Appendix C)
  4. Heard speech for or against capital punishment (Appendices D and E)
  5. Filled out speech rating form (Appendix F)
  6. Recalled speech--only subjects in immediate recall condition (form for recall in Appendix G)

C. Second session of experiment (instructions in Appendix H)
  1. Filled out rating form
  2. Recalled speech
  3. Read and discussed neutral passage (Appendix I)
  4. Filled out post-measure survey (Appendix J)
  5. Filled out manipulation check form (Appendix K)
  6. Recalled neutral passage
  7. Received complete debriefing

Scoring of recall data

The five measures listed below were obtained for each subject's recall of the speech on capital punishment:

1. Number of words recalled
2. Number of ideas recalled
3. Average amount of direction-specific distortion
4. Average amount of nondirection-specific distortion
5. Average importance of units recalled

Measure 1. The first measure was obtained by counting the number of words used in the recalled speech. Obvious editorial comments and interjections by the subject were excluded from the count since it was desired to include only those words that represented attempts at recall.

Measure 2. Scoring the number of idea units involved several stages. First, the original speech was divided up into "idea" units. These units correspond to entire sentences in the speech and are numbered as used for scoring in Appendices D and E. The reason for using sentences as the basic units is discussed in the Introduction of this paper. Since the units defined in this manner vary somewhat in length, complexity, and redundancy in relation to other units, it was decided to subdivide some of the units to give them a higher weight in the total score. These subdivisions are also noted in Appendices D and E by slashes in the sentences. Sentences that were not subdivided were subsequently scored either 1 or 0 while those with two subdivisions could score 2, 1, or

0, and likewise for those with three divisions.

The first step in scoring a given subject's recall was to find units in the recalled speech which were judged to correspond to units in the original. These recalled units were marked and numbered accordingly. Then the recalled units were listed and scored either 1, 2, or 3 points depending on their judged completeness in relation to the original and depending on the possible number of points contained in the original unit. The scores were then added to obtain a measure of the total quantity of ideas recalled by the subject.

Measure 3. The measure of direction-specific distortion was obtained using the units previously listed as recalled by the subject. Each of these units was rated for the amount of distortion using the following categories:

-1 = recalled unit is more strongly worded, more radical in implication, more unqualified, or more forcibly stated than original unit with respect to stand on capital punishment issue

0 = recalled unit takes same position on capital punishment as original unit even though it may be distorted in other dimensions

+1 = recalled unit is less strongly worded, less radical in implication, less unqualified, or less forcibly stated than original unit with respect to stand on capital punishment, but it is

still on same side of issue as original

+2 = recalled unit takes position on capital punishment on opposite side of issue from original statement, e.g. a pro statement is recalled as one supporting the con position

Figure 2 translates these categories into scales for the pro speech and con speech, respectively, and may help clarify the meanings of the rating categories.

Of course, the scales in this figure assume that all statements in the pro capital punishment speech argue for capital punishment and vice versa. In reality, there are a few statements in the speeches which present a position somewhat opposite to that of the entire speech but which are then qualified or refuted in later statements. Statement 10 in the pro speech regarding the Supreme Court ruling and statement 12 in the con speech referring to states reinstituting capital punishment fall into this category. To handle these special cases the following categories were used:

+1 = recalled statement takes more radical position than original

0 = recalled statement takes essentially same position as original

-1 = recalled statement takes less radical position than original but takes same side of issue as original

-2 = recalled statement takes opposite position from original

This reversed scoring system makes the scoring internally consistent within each speech, e.g. every -1 in a pro speech means the statement

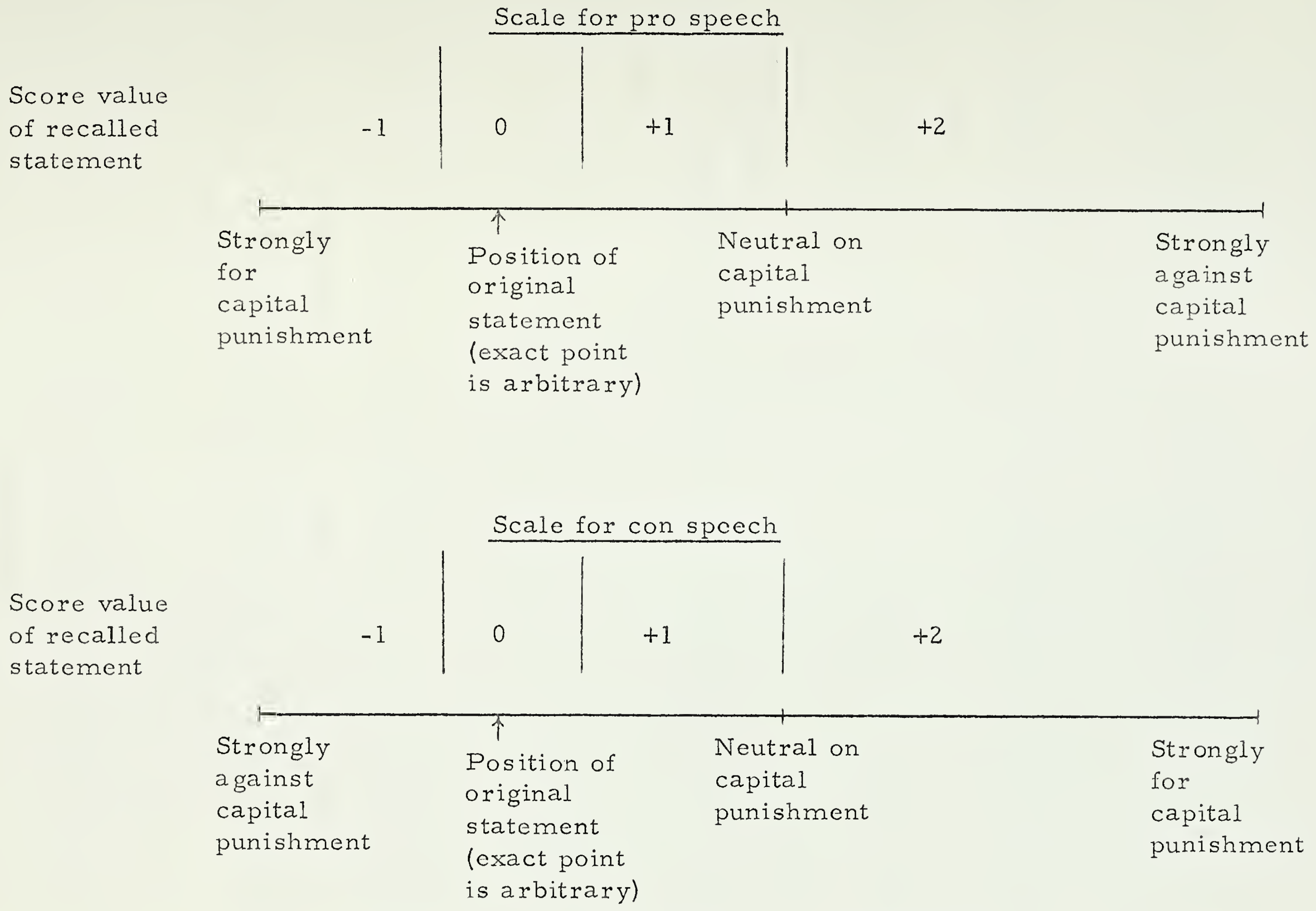
Scale for pro speech
Score value of recalled statement
-1
0
+1
+2
Strongly for capital punishment
Position of original statement (exact point is arbitrary)
Neutral on capital punishment
Strongly against capital punishment
Scale for con speech
Score value of recalled statement
-1
0
+1
+2
Strongly against capital punishment
Position of original statement (exact point is arbitrary)
Neutral on capital punishment
Strongly for capital punishment

Fig. 2 . Scales for rating direction-specific distortion.

takes a stronger pro position than the original.

To score a given subject's recall for direction-specific distortion, each unit previously listed for the quantity scoring (measure 2) was assigned a -2, -1, 0, +1, or +2 using the above systems. These scores were then summed over all the units recalled and divided by the total number of recalled units to obtain an average distortion score for each subject's recalled speech. This score can best be interpreted as how radical on the average the recalled speech is in relation to the original speech. A minus score indicates a more radical speech and vice versa.

Measure 4. The nondirection-specific distortion score was obtained by taking the absolute value of the direction-specific scores described above for each unit. Thus, the only change occurs for negative numbers which then become positive. Again the scores were summed over all the units and divided by the total number of units recalled to obtain an average score for each recalled speech. This score can be interpreted as the average amount of distortion in both a more radical and less radical direction than the original. All scores are positive and the higher the score, the more the subject tended to distort the original statements into more radical and less radical statements.

Measure 5. The scoring of the average importance of the recalled statements involved some preliminary ratings by independent judges. The raters were composed of 29 undergraduate students from Duke University and 16 undergraduate students from the University of North

Carolina at Chapel Hill who volunteered to help the experimenter without credit or pay. These raters were given the instructions contained in Appendix L, along with three copies of either the pro speech or the con speech. The instructions essentially asked them to indicate the most important 1/4 of the units, the second most important 1/4 of the units, the third most important 1/4, and the least important 1/4. Importance of a unit was taken to mean its contribution to the overall effectiveness and meaning of the speech and is further defined in the instructions in Appendix L. The method used for progressive elimination of the ideas according to their importance to the speech was adapted from methods employed with reasonable success by Johnson (1970).

Units that were scored by raters as most important were assigned a score of 4; the next most important, 3; the third most important, 2; and the least important, 1. A summary was made of all the scores for each statement or unit in the speech. From studying the distribution of these scores and because of the intended use of the scores, it was decided to average the scores for each statement by finding the mode of the ratings. This type of average gives the maximum differentiation among statements in the speech and gives a simple score of 1, 2, 3, or 4 to each statement. In the case of three statements in the con speech (15, 16, and 22) and two in the pro speech (19 and 20), a single mode could not be found because two adjacent scores had equal frequencies. To simplify the scoring for these exceptions, the one of the two possible

modes which most closely corresponded to the median was used (see Tables 19 and 20 in Appendix M for frequency distributions of ratings and modes for units in pro and con speeches). The ratings from Duke and the University of North Carolina were combined in finding the mode because there were no substantial differences between the two groups, and it was felt that the larger sample would increase the reliability of the mode.

To find the average importance of the statements in an individual subject's recall, each of the recalled units was scored 4, 3, 2, or 1 based on its modal rating. The scores were summed over all the recalled units and divided by the total number of units to obtain an average importance score for the statements in each recalled speech.

Measures of neutral passage. Only two recall measures were obtained on the neutral passage. These measures correspond to the first two measures on the capital punishment speech, i.e., number of words and number of idea units. The number of words was scored in a manner completely parallel to the scoring of the capital punishment speech. The measurement of the number of units was simplified somewhat to speed up scoring using the following procedure. First, the neutral passage was divided into units as shown by the slashes in the speech in Appendix I. If a recognizable version of one of these units was present in the subject's recall, it was scored 1 point; if not, it received a score of 0. The number of ideas recalled by a subject was then obtained by summing the scores for all units in his recall of the neutral passage.

Reliability of scoring system

The experimenter scored all subjects' recalls for both the capital punishment speeches and the neutral passage. The recall sheets were identified by only a randomly assigned number at the time of scoring to eliminate scoring biases on the part of the experimenter. Since several of the recall scores are original to this study and involve difficult decisions, some measurement of the reliability of these scores was considered to be necessary. Therefore, a decision was made to have independent judges score a sample of the recalls of the capital punishment speeches and then to compare their ratings with those of the experimenter. Three aspects of the scoring process were focused on for the reliability estimates since they were the only parts that involved judgments on the scorer's part. These three aspects are (a) locating and marking units in subjects' recalls which correspond to units in the original speech, (b) scoring the completeness of these units (possible scores = 3, 2, 1), and (c) scoring the amount of direction-specific distortion in these units (possible scores = -2, -1, 0, +1, +2).

Two scorers (referred to henceforth as A and B) were selected for this task by the experimenter. Scorer A was a graduate student in psychology with a substantial background in English, and scorer B was an associate professor in the area of teachers' education. Training A and B first involved giving them a detailed explanation of the scoring methods used by the experimenter. After discussing these methods and

studying written summaries of the procedures, the scorers received several practice trials using recalls other than those chosen for the reliability check. A and B received frequent feedback on their performance and were given opportunities to discuss further the scoring procedures during their training. Training was completed when both the experimenter and the scorer felt that the scorer thoroughly understood the procedure and was confident in his judgments. A was trained on a total of about 15 recalls, while B's training took somewhat longer with a total of about 25 practice scorings. The scorers were then assigned a random sample of 20 recalls to score, receiving feedback after every five. They scored the sample by first finding units in the recall which they thought corresponded to units in the original. Then they were given the units identified by the experimenter and proceeded to score completeness and distortion.

Probably the clearest way to present comparisons between scorers is to examine the percent of agreement between two raters on a given type of judgment. Table 3 presents this information for the three scorers and three types of judgments made. The percent of agreement on all three types of judgments indicates a reasonable degree of reliability, considering the difficulty of the judgments involved. Most of the disagreements were related to the scorers interpreting the meaning and implications of certain words or phrases differently. This type of difference especially affected judgments of the direction of distortion since

this measure involves comparing the meaning of the original words with that of the recalled words. However, all three scorers felt that their judgments were based on a clearly defined set of criteria and that it was possible to make consistent judgments using these criteria.

Table 3

Percent of Agreement Between Scorers on Recall Judgments Using Sample of 20 Recalls

Type of Judgment	A and Experimenter	B and Experimenter	A and B
Identifying units	86.1	86.5	82.5
Scoring completeness of units	92.1	94.1	91.6
Scoring amount of distortion	76.2	70.8	67.8

RESULTS

Analysis of manipulation check data

Responses to the three manipulation check questions (questions 2, 3, and 4 in Appendix K) were analyzed using a multivariate analysis of variance and the full factorial design. The means and standard deviations for all three questions in each cell of the design are given in Table 21 in Appendix N.

A summary of the analysis of variance is presented in Table 4. The analysis provides strong evidence that the subjects in the various commitment conditions did respond differently to the manipulation check questions, since the null hypothesis was rejected at the $p < .001$ level for all three questions. Subjects' mean scores on these questions are summarized in Table 5. It is clear from examining this table that the principal differences in the responses to the first two questions were due to high commitment subjects responding with a higher feeling of commitment than both low and no commitment subjects ($p < .001$ for pre-planned contrasts on both questions). As expected, low commitment subjects did not differ from no commitment subjects on these two questions since the two groups received exactly the same instructions with respect to these

Table 4

Analysis of Variance for Manipulation Check Questions

Source	Question 1			Question 2			Question 3			Multivariate Tests		
	df	MS	F	df	MS	F	df	MS	F	df Effect	df Error	F[a]
Commitment (A)	2	22.97	32.74***	2	16.90	42.95***	2	8.31	18.43***	6	212	19.41***
Time of recall (B)	1	2.13	3.04	1	.30	.76	1	1.41	3.12	3	106	2.14
Consistency (C)	1	.83	1.19	1	.53	1.35	1	.08	.17	3	106	.84
A x B	2	.26	.37	2	1.20	3.04	2	.61	1.35	6	212	2.11
A x C	2	.26	.37	2	2.43	6.17**	2	.18	.39	6	212	2.15*
B x C	1	.83	1.19	1	.83	2.11	1	.08	.17	3	106	1.36
A x B x C	2	.11	.15	2	.93	2.37	2	.78	1.72	6	212	1.17
Within cells (error)	108	.70	-	108	.39	-	108	.45	-	-	-	-

[a] Multivariate tests of significance are based on Wilks' lambda criterion.

*$p < .05$.

**$p < .01$.

***$p < .001$.

Table 5

Mean Scores on Manipulation Check Questions as a Function of Degree of Experimental Commitment

Degree of Commitment	Question 1	Question 2	Question 3
High	3.48	2.45	2.00
Low	2.15	1.35	1.43
No	2.18	1.30	1.10

Table 6

Mean Scores on Manipulation Check Question Number 2 as a Function of Commitment and Consistency

Degree of Commitment	Consistent Information	Inconsistent Information
High	2.10	2.80
Low	1.40	1.30
No	1.40	1.20

questions.

On the third question, high commitment subjects again differed from both low and no's ($p < .001$), and low commitment subjects also scored higher than no's ($p < .03$). Again these differences were as predicted since the third question refers to the degree of a public stand taken on capital punishment, and low commitment subjects were not expected to feel that they had taken much of a public stand, if any.

The only other significant difference occurred as a result of an interaction between commitment and consistency on the second question ($p < .01$). The pattern of means contributing to this interaction is shown in Table 6. Apparently subjects in the high commitment, inconsistent information condition felt that they were more likely to be identified as the speaker than subjects in the high commitment, consistent conditions, and this difference did not occur in either the low or no commitment condition. However, as can be seen in Table 4, this result is not duplicated for either the first or third question ($F < 1$ in both cases) and so is difficult to interpret in any meaningful way. Since the commitment main effect is so strong and consistent across all questions, this interaction is not considered to cause any interpretation problems.

Because of the selection problem outlined in the methods section created by pro subjects dropping out of the experiment, an additional analysis was performed with pro-con (subjects either for or against capital punishment) as a fourth factor. The interaction between pro-con

and degree of commitment was far from significant on any of the three questions (F = .24, 1.91, and .41, respectively). This outcome provides strong support for the contention that pro subjects did not feel a different degree of commitment than con subjects and that no serious selection problem exists in the experiment in this respect.

In summary, the analysis of the manipulation check questions showed that high commitment subjects felt more strongly committed than either low or no's in terms of thinking that (a) more people would hear the tape recording they would make, (b) the people would be likely to recognize them, and (c) making the tape represented taking a public stand. Low commitment subjects differed from no's only in that they felt that they were taking more of a public stand by agreeing to make the tape on capital punishment.

Analysis of recall data: nonrepeated measures

A summary of the recall data for each of the five recall measures appears in Table 22 in Appendix N. The recall data were analyzed using a multivariate analysis of covariance with three covariates--pre-measured attitude toward capital punishment, number of words recalled from the neutral passage, and number of ideas recalled from the neutral passage. The results of the covariance analysis are reported in Table 7. The regression with the three covariates was significant with respect to the dependent variables of number of words and number of ideas recalled.

Table 7

Analysis of Covariance for Recall Measures (Nonrepeated)

	Number of Words			Number of Ideas			Direction-Specific Distortion		
Source	df	MS	F	df	MS	F	df	MS	F
Regression	3	41,452	15.74***	3	105.4	7.89***	3	.190	2.18
Commitment (A)	2	461	.17	2	4.7	.35	2	.122	1.41
Time of recall (B)	1	146,397	55.59***	1	1,814.2	135.8***	1	.113	1.30
Consistency (C)	1	1,579	.60	1	3.2	.24	1	.021	.24
A x B	2	13,304	5.05**	2	95.4	7.14***	2	.075	.86
A x C	2	576	.22	2	34.2	2.56	2	.002	.02
B x C	1	29	.01	1	17.0	1.27	1	.000	.00
A x B x C	2	703	.27	2	13.4	1.00	2	.007	.08
Within cells (error)	105	2,633	-	105	13.4	-	105	.087	-

Table 7--Continued

Source	Nondirection-Specific Distortion			Importance of Ideas			Multivariate Tests		
	df	MS	F	df	MS	F	df Effect	df Error	F[a]
Regression	3	.077	2.05	3	.029	.30	15	279	4.94***
Commitment (A)	2	.044	1.16	2	.261	2.72	10	202	1.08
Time of recall (B)	1	.139	3.67	1	.565	5.90*	5	101	27.97***
Consistency (C)	1	.046	1.23	1	.002	.02	5	101	.37
A x B	2	.062	1.63	2	.011	.11	10	202	1.91*
A x C	2	.097	2.57	2	.009	.09	10	202	1.43
B x C	1	.001	.02	1	.263	2.74	5	101	1.33
A x B x C	2	.015	.38	2	.032	.33	10	202	.39
Within cells	105	.038	-	105	.096	-	-	-	-

Note. Analysis included three covariates.

[a] Multivariate tests of significance based on Wilks' lambda criterion.

*p < .05.

**p < .01.

***p < .001.

This result was not surprising since the covariates relate most directly to these dependent variables.

Tests of Hypotheses 1 and 2. As outlined in the introduction, Kiesler's (1971) work leads to the prediction in Hypothesis 1 of a commitment x consistency interaction (A x C) for the amount of information recalled. Hypothesis 2 predicts further that this interaction should become stronger as the time of recall (factor B) increases, perhaps leading to a three-way interaction (commitment x consistency x time of recall). As it turns out, however, the A x C and A x B x C interactions were not significant in either the multivariate test or in the univariate tests of number of words and number of ideas recalled. The commitment x consistency interaction for number of ideas recalled was close to being significant ($p < .09$), but an inspection of the means shown in Table 8 reveals that the trend is exactly opposite to that hypothesized. That is, high commitment subjects recalled somewhat more inconsistent than consistent material in both the immediate and delayed recall conditions. Thus, the results provide no support for Hypotheses 1 or 2 and, in fact, almost represent a significant reversal of Hypothesis 1.

Further tests. All other main effects and interactions were also tested to explore other possible outcomes. As can be seen in Table 7, there was a significant multivariate commitment x time of recall interaction. The interaction was significant on the univariate level for number of words and number of ideas recalled. The patterns of means

Table 8

Mean Number of Ideas Recalled

	Immediate Recall		Delayed Recall		Immediate + Delayed	
Degree of Commitment	Consistent Information	Inconsistent Information	Consistent Information	Inconsistent Information	Consistent Information	Inconsistent Information
High	13.87	16.02	8.94	10.24	11.41	13.13
Low	17.33	14.67	8.74	9.86	13.04	12.26
No	19.97	17.24	7.87	6.74	13.93	11.99

Note. Means are adjusted for three covariates.

corresponding to these interactions are presented in Table 9. In the immediate recall condition, the higher the commitment the lower the recall scores were, while in the delayed recall condition the opposite ordering prevailed. Tukey's multiple comparison method was used to examine the differences between pairs of means across commitment conditions; the only difference between means significant at the .05 level occurred between the high commitment immediate recall and no commitment immediate recall conditions for the number of ideas recalled.

The only other effect of interest was the significant increase in the importance of ideas recalled as a function of time ($\underline{p} < .05$). Subjects in the immediate recall condition recalled ideas with a mean importance rating of 2.41 as compared to a mean of 2.55 for subjects in the delayed recall condition (rating scale has a range of 1 to 4). This finding corresponds with Johnson's (1970) results since he also found an increase in importance of ideas recalled as time progresses. The difference in the present study was not large, but does support the validity of the importance measure since it replicates previous results.

Again, because of the possible selection problem for pro subjects, a re-analysis was conducted using pro-con as a fourth factor in the multivariate analysis with the prime effects of concern being the interaction of pro-con with the A x B x C, A x C, and A x B effects on the number of words and number of ideas recalled. There was absolutely no evidence of a difference between pro and con subjects with respect to these three

Table 9

Mean Number of Words and Ideas Recalled as a Function of Commitment and Time of Recall

	Number of Words		Number of Ideas	
Degree of Commitment	Immediate Recall	Delayed Recall	Immediate Recall	Delayed Recall
High	170.9	131.4	14.94	9.59
Low	184.0	124.7	16.00	9.30
No	213.4	102.5	18.61	7.31

Note. Means are adjusted for three covariates.

interactions.

Analysis of recall data: repeated measures

The data summaries for the repeated recall measurements on those subjects who recalled both immediately and after a delay of 1 week are given in Table 23 in Appendix N. An analysis of the delayed recall data was conducted along with the immediate recall data used in the previous analysis. A multivariate analysis of covariance was used with the repeated measures represented as additional dependent measures, thus, for analysis purposes, reducing the design to 6 cells and increasing the number of dependent variables to 10. The results of the covariance analysis are reported in Table 10. The regression on the three covariates was significant with respect to number of ideas recalled and the importance of ideas recalled.

Tests of Hypotheses 1 and 2. Once again, there is no evidence of a commitment x consistency (A x C) or a commitment x time x consistency (A x B x C) interaction. An inspection of the means in Table 11 shows the same trend in the delayed recall data as appeared in the nonrepeated measures data, a trend in the reverse direction from the effect hypothesized.

Further tests. An examination of the commitment x time of recall (A x B) interaction for number of words and number of ideas recalled failed to replicate the significant effect found with the previous delayed

Table 10

Analysis of Covariance for Recall Measures (Repeated)

	Number of Words			Number of Ideas			Direction-Specific Distortion		
Source	df	MS	F	df	MS	F	df	MS	F
Regression	1	174	.02	1	425.9	8.33**	1	.256	1.37
Commitment (A)	2	26,083	3.74*	2	155.4	3.04	2	.085	.45
Time of recall (B)	1	110,866	61.58***	1	1,016.9	83.64***	1	.009	.13
Consistency (C)	1	684	.10	1	33.3	.65	1	.225	1.21
A x B	2	1,298	.72	2	16.8	1.38	2	.068	1.00
A x C	2	4,421	.63	2	92.4	1.81	2	.039	.21
B x C	1	329	.18	1	8.0	.66	1	.395	5.83*
A x B x C	2	3,772	2.09	2	5.8	.48	2	.094	1.40
Error (Regression, A, C, and AC)	51	6,974	-	51	51.1	-	51	.187	-
Error (All B effects)	51	1,800	-	51	12.1	-	51	.068	-

Table 10--Continued

Source	Nondirection-Specific Distortion			Importance of Ideas			Multivariate Tests		
	df	MS	F	df	MS	F	df Effect	df Error	F^a
Regression	1	.165	2.48	1	.858	5.24*	5	47	4.94**
Commitment (A)	2	.225	3.38*	2	.461	2.81	10	94	2.56**
Time of recall (B)	1	.034	1.06	1	.563	6.34*	5	47	19.09***
Consistency (C)	1	.009	.13	1	.829	5.05*	5	47	1.80
A x B	2	.052	1.62	2	.028	.32	10	94	1.16
A x C	2	.055	.82	2	.001	.01	10	94	.73
B x C	1	.021	.65	1	.003	.03	5	47	1.14
A x B x C	2	.018	.55	2	.019	.22	10	94	1.46
Error (Regression, A, C, and AC)	51	.066	-	51	.164	-	-	-	-
Error (All B effects)	51	.032	-	51	.089	-	-	-	-

Note. Analysis included three covariates.

[a] Multivariate tests of significance based on Wilks' lambda criterion.

$*p < .05$. $**p < .01$. $***p < .001$.

Table 11

Mean Number of Ideas Recalled (Repeated Measure)

Degree of Commitment	Immediate Recall		Delayed Recall		Immediate + Delayed	
	Consistent Information	Inconsistent Information	Consistent Information	Inconsistent Information	Consistent Information	Inconsistent Information
High	14.09	15.86	10.98	12.72	12.53	14.29
Low	17.33	14.81	12.05	11.52	14.69	13.17
No	19.85	17.26	14.79	12.44	17.32	14.85

Note. Means are adjusted for three covariates.

recall data. The means for this interaction are given in Table 12. In this case, the means for the delayed recall did not reverse in rank order compared with the immediate recall. In fact, the rank ordering remained about the same as in immediate recall, and there was a significant main effect of commitment for the number of words recalled ($\underline{p} < .05$). This effect is shown in Table 13 along with the differences in number of ideas recalled. A closer inspection of the data reveals that, in general, subjects who were retested after a delay forgot less information than subjects who were tested only once. This facilitating effect of repeated testing on recall may have been responsible for the different results using the repeated and nonrepeated designs.

There was also a significant main effect of commitment on the amount of nondirection-specific distortion ($\underline{p} < .05$), and this effect is shown in Table 13. It is apparent from an inspection of the means that high commitment subjects distorted the information more than either low or no commitment subjects.

The main effect of time of recall on the importance of ideas recalled was replicated in the repeated measures design ($\underline{p} < .05$) with the importance increasing slightly over the delay of 1 week (mean importance rating for immediate recall was 2.41; for delayed recall it was 2.51). In addition, there is a main effect of consistency of information on the importance of ideas recalled ($\underline{p} < .05$). Subjects who heard consistent information recalled ideas with a mean importance of 2.51 as contrasted

Table 12

Mean Number of Words and Ideas Recalled as a Function of Commitment and Time of Recall (Repeated Measures)

	Number of Words		Number of Ideas	
Degree of Commitment	Immediate Recall	Delayed Recall	Immediate Recall	Delayed Recall
High	171.59	136.81	14.97	11.85
Low	184.02	140.87	16.07	11.78
No	214.81	163.78	18.55	13.61

Note. Means adjusted for three covariates.

Table 13

Mean of Recall Measures as a Function of Degree of Commitment (Repeated Measures)

Degree of Commitment	Number of Words	Number of Ideas	Nondirection-Specific Distortion
High	154.21	13.41	.494
Low	162.58	13.92	.401
No	189.29	16.08	.403

Note. Means are adjusted for three covariates.

Table 14

Mean Direction-Specific Distortion as a Function of Time of Recall and Consistency of Information (Repeated Measures)

Time of Recall	Consistent Information	Inconsistent Information
Immediate	.105	.085
Delayed	.011	.154

with a mean importance of 2.40 for subjects who heard inconsistent information.

The only other significant finding was an interaction between time of recall and consistency on the measure of direction-specific distortion. This result is reported in Table 14, and an examination of the means reveals that subjects who heard consistent information distorted the material in a more radical direction as time increased while subjects who heard inconsistent information distorted it in a less radical direction with the passage of time. None of the paired comparisons of means was significant at the .05 level using Tukey's multiple comparison procedure.

To test for pro-con differences, a re-analysis was conducted, as before, with pro-con as a factor in the multivariate analysis to see if this factor interacted with any of the significant or predicted results. Once again, no evidence of such interactions was found.

Summary of recall results

In summary, no support was found for Hypotheses 1 and 2 in either the nonrepeated or repeated measures recall data. A secondary finding is that the importance of ideas recalled increases slightly as the retention interval increases in both designs.

The recall measures of direction-specific distortion, nondirection-specific distortion, and importance of ideas were involved in very few, if any, effects of interest. Since many tests of significance were conducted

because of the exploratory nature of the study, some attempt should be made to assess realistically the level of significance of these non-hypothesized results. There are two approaches that can be used to protect the significance levels even though several tests were done. One of these is the Bonferroni technique and involves correcting the significance levels for the number of tests conducted using a simple additive approach. Another technique is based on the calculation of a multivariate statistic at a certain significance level and comparing this value with the univariate F values. Both techniques are discussed fully by Harris (1975) and will not be elaborated here.

Both of these approaches were used to re-assess the previously reported significance levels, and the results are presented in Table 15. It is readily apparent from an examination of Table 15 that most of the outcomes originally reported as significant must be regarded with a great deal of caution because they could very well represent Type I errors. In fact, Table 15 gives an incomplete picture since the significance levels are adjusted only for conducting five tests of each effect (corresponding to the five recall variables), but this procedure does not account for the seven effects tested in each design (A, B, C, A x B, A x C, B x C, and A x B x C). Accounting for all effects tested on all variables would only serve to weaken the effects further.

The results given in Table 15 show that no effects were significant at the .05 level when the univariate F values were compared with the

Table 15

Summary of Nonhypothesized Recall Findings

Design	Source	Variable	Reported Significance Level	Significance Level Based on Bonferroni Adjustment for Five Tests	Significance Level Based on Multivariate Statistic at the .05 Level
Nonrepeated	A x B	Number of words	$p < .01$	$p < .05$	n. s.
Nonrepeated	A x B	Number of ideas	$p < .001$	$p < .005$	n. s.
Repeated	A	Number of words	$p < .05$	n. s.	n. s.
Repeated	A	Nondirection-specific distortion	$p < .05$	n. s.	n. s.
Repeated	C	Importance of ideas	$p < .05$	n. s.	n. s.
Repeated	B x C	Direction-specific distortion	$p < .05$	n. s.	n. s.

Note. n. s. = not significant.

multivariate statistic; however, the commitment x time of recall interaction (A x B) is still significant using the Bonferroni adjustment, especially with regard to the number of ideas recalled. Therefore, one could reasonably conclude that the rejection of the null hypothesis for the A x B interaction is most likely not a Type I error. No such conclusion can be made for the other effects originally labeled as significant.

Analysis of attitude change data

Table 24 in Appendix N contains a summary of subjects' attitudes toward capital punishment measured both before and after the experiment. Two types of analysis were conducted on the attitude change data--the correlations between attitude change and the five recall measures were calculated, and an analysis of covariance of attitude change as a function of the experimental conditions was performed.

Test of Hypothesis 3. Table 16 reports the correlations obtained between the degree of subjects' attitude change and the amount of material recalled. Hypothesis 3 states that there should be a positive correlation between the amount of inconsistent material retained and the amount of attitude change toward the position advocated by the inconsistent message. Inspection of the correlations in the first two columns of Table 16 reveals that there is a significant negative correlation ($r = -.376$) between number of inconsistent ideas recalled after 1 week and attitude change toward the message. This result is a striking and direct contradiction of the

Table 16

Correlations of Attitude Change with Recall Variables

Time of Measurement	Number of Words	Number of Ideas	Direction-Specific Distortion	Nondirection-Specific Distortion	Importance of Ideas
Immediate recall	-.134	-.083	-.046	.221	.114
Delayed recall (nonrepeated measure)	-.320	-.376*	.096	-.171	.010
Delayed recall (repeated measure)	-.118	-.097	.190	.361*	.344
Difference score (immediate minus delayed for repeated measure)	-.038	.025	-.185	-.147	.146

Note. Recall data represent recall of inconsistent material only.

*$p < .05$.

hypothesis. Further inspection of Table 16 reveals that all of the correlations between amount of material recalled (number of words and number of ideas) and attitude change are negative and also that the delayed recall in the nonrepeated measures case yields the highest correlation (and the only statistically significant one). The presence of all negative correlations makes Hypothesis 3 very difficult to defend and, in fact, makes the opposite hypothesis considerably more plausible.

Further correlations. To explore the relation between attitude change and the other recall measures, correlations were also calculated for these measures and are reported in Table 16. The only other significant correlation occurred between the amount of nondirection-specific distortion and attitude change, with those subjects who changed the most showing the most distortion of the material ($r = .361$). However, this correlation must be regarded with suspicion since it was significant for only the delayed recall in the repeated measures case, and, in fact, the correlation for the nonrepeated measure is in the opposite direction ($r = -.171$). Furthermore, since 20 correlations were calculated, an unpredicted correlation that is significant at only the .05 level has a high probability of exemplifying a Type I error rather than a reliable result.

Further analysis of the attitude change data. An analysis of covariance was conducted using post-measured attitude as the dependent variable and pre-measured attitude as the covariate. This analysis is equivalent to using attitude change as the dependent variable, but is a

preferred method for statistical reasons. The results of this analysis are reported in Table 17. The only significant effect was the expected main effect of consistency, with subjects showing more attitude change toward neutral after hearing inconsistent information than after hearing consistent information. This effect is shown in the last row of Table 18.

According to Kiesler's (1971) concept of commitment, higher commitment should make beliefs and attitudes more resistant to change through persuasion. This effect should have shown up as a commitment x consistency interaction or a main effect of commitment, neither of which were found to be significant in the present analysis. Furthermore, the trend of the data in the inconsistent cells is in the wrong direction, as can be seen in Table 18; subjects tended to show more change as the degree of commitment increased.

Two re-analyses of the data were performed to test once more for pro-con differences. The first re-analysis checked whether pro's and con's showed differing amounts of attitude change on the effects predicted or found to be significant in the previous analysis. None of the interactions involving the pro-con factor approached statistical significance. The other re-analysis (using an analysis of variance with pre-measured attitude as the dependent variable) examined whether subjects differed in the strength of their pre-measured attitude as a function of the experimental conditions and the pro-con factor. Again no effects were even close to being significant. Apparently the differential drop-out of pro

Table 17

Analysis of Covariance for Attitude Change Data

Source	df	MS	F
Regression	1	982.98	47.44**
Commitment (A)	2	8.39	.41
Time of recall (B)	1	6.38	.31
Consistency (C)	1	138.46	6.68*
A x B	2	17.90	.86
A x C	2	27.96	1.35
B x C	1	.01	.00
A x B x C	2	32.02	1.54
Within cells (error)	107	20.72	-

Note. Pre-measured attitude was used as the covariate.

*$p < .05$.

**$p < .001$.

Table 18

Attitude Change as a Function of Commitment and Consistency of Information

Degree of Commitment	Consistent Information	Inconsistent Information
High	.30	2.90
Low	- .80	2.55
No	1.50	1.85
All commitment conditions combined	.33	2.43

Note. Positive scores reflect change toward weaker position than original and vice versa for negative scores.

subjects in the commitment conditions was not a function of the strength of their initial attitude since this would have shown up in the second re-analysis.

DISCUSSION

No support for any of the three hypotheses was found in this study. In fact, the results are quite difficult to explain within the various aspects of the framework set forth, since, in the case of Hypothesis 1, the trend of the data was in the direction of a disconfirmation, and such a disconfirmation actually did occur in the case of Hypothesis 3.

Since there was strong evidence that the commitment manipulation was successful, the reasonable conclusion is that the different degrees of commitment felt by subjects in this study did not affect their retention of information in the ways hypothesized. In other words, higher degrees of commitment did not lead to relatively greater forgetting of inconsistent information even when this effect was given a week's delay to develop. It is possible that the range of commitment explored in this study within the limits imposed by the laboratory setting was not sufficient to allow for real differences between conditions to develop. The foregoing argument would be more plausible if the data had shown a nonsignificant trend in the right direction, but, in point of fact, the trend was in the opposite direction. The only other type of argument that could preserve the hypothesis intact would be that some other, more powerful variable affected retention

in such a way as to mask the effects of commitment, but, since an attempt was made to control the main variables thought to be influential in the retention process, it is very difficult to identify what this unknown variable may be.

Perhaps some information can be gleaned from a further examination of the interaction between commitment and time of recall in reference to the amount of material recalled. In the immediate recall condition, subjects retained more material when the commitment was lower (Table 9, p. 68). Perhaps the commitment manipulation caused more anxiety and preoccupation on the subjects' part when the stakes were greater, and therefore there was an initial deficit in learning for those subjects who experienced a higher degree of commitment. In the experimenter's opinion, an effect of this sort would be plausible since subjects did seem to experience relatively more discomfort during the carrying out of the high commitment manipulation.

The reversal of this effect after a week's delay for those subjects measured only once is more difficult to explain. Perhaps there were differences in the extent to which subjects thought about the experiment and went over the arguments in the speech during the intervening week as a function of what sort of commitment they made. Those subjects who had taken a public stand may have felt more nervous and anxious about the experiment and thought more about the speech than subjects who had not. If so, retention may have been affected by differential rehearsal. An

effect of this sort is reminiscent of Jones and Aneshansel's (1956) findings that the greater the perceived usefulness of the material, the better the retention. Of course, in the present study, every attempt was made to equate usefulness across commitment conditions. Yet, even though in the experimenter's view the information in the speeches was no more useful to subjects in one condition than another, subjects may have regarded the situations differently. Perhaps in the high commitment condition subjects actively rehearsed the information so that they could prepare arguments and counter-arguments to defend their position when challenged by others after their position was made public. Given the nature of the commitment manipulation used in this study (which relies on varying the public nature of the act), there is no way to balance out effects of this sort.

However, such possibilities as different levels of anxiety and different amounts of rehearsal do not clearly provide the "unknown" variables which can rescue Hypotheses 1 and 2. These variables should affect retention uniformly whether the information retained was consistent or inconsistent (in fact, there was no interaction with the consistency factor) and thus would not really mask the sorts of effects originally hypothesized. No matter what line of defense is employed, the hypothesized effect of commitment on retention is not supported by the findings.

The relation of retention of inconsistent material to attitude change was found to be opposite to that hypothesized. The data supported the

interpretation that the more the subject's attitude changed toward the position advocated in a counter-attitudinal speech, the less he could recall of the speech. This finding seems counter-intuitive on first inspection but perhaps can be made more plausible by further analysis. There are two lines of thought which could explain this result.

The first involves the possibility that those subjects who changed most toward the position advocated in the speech were the most threatened by the material and thus most likely to be defensive. None of the subjects in this situation actually switched from one side of the issue to the other but instead only moved toward or away from the neutral point. Thus, if subjects who changed the most were the ones most threatened, they may have defended against the threat by forgetting more of the speech than subjects who changed less. Of course, this is similar to the "classic" effect of attitude on retention which has been searched for in vain in many of the studies reviewed earlier in this paper. However, the other studies did not attempt to measure how threatened or defensive subjects were when confronted by inconsistent material, nor did the present study directly. The present line of reasoning suggests that those who change the most toward the position advocated in the speech (without completely changing sides) are those who are likely to react defensively toward the information and forget more of it. To the investigator's knowledge, this line of reasoning has never been directly tested in previous studies.

An alternative hypothesis to explain the correlation is based on the line of thought that the more one incorporates material into his own position on an issue, the less available it is for recall. In other words, subjects in this study who changed the most because of the speech they heard may have had more difficulty recalling the information because it had actually become a part of their own belief structure and thus difficult to separate from their own thoughts when recalling it.

These two lines of reasoning lead to different predictions under certain circumstances, namely when a subject completely switches positions. The defensive hypothesis would predict that subjects should recall information better when they completely switch positions than when they only change towards neutral since their reason for suppressing the material no longer exists when they switch positions. In other words, for the defensive hypothesis, a U-shaped function relating attitude change and retention should exist as shown in Figure 3.

The assimilation hypothesis, which is based on material being harder to recall the more it becomes part of one's position, predicts a different relationship. The prediction would be that recall should become increasingly harder the more one's attitude changes toward the position advocated in the speech regardless of whether the person switches position. Thus, the relationship would be more like that depicted in Figure 3 for the assimilation hypothesis. There are no data available in this experiment to decide this issue since only a few of the subjects even

crossed the neutral point in changing their position, and so a follow-up study would have to be designed to test which of these hypotheses better predicts the actual relation between attitude change and retention of inconsistent material.

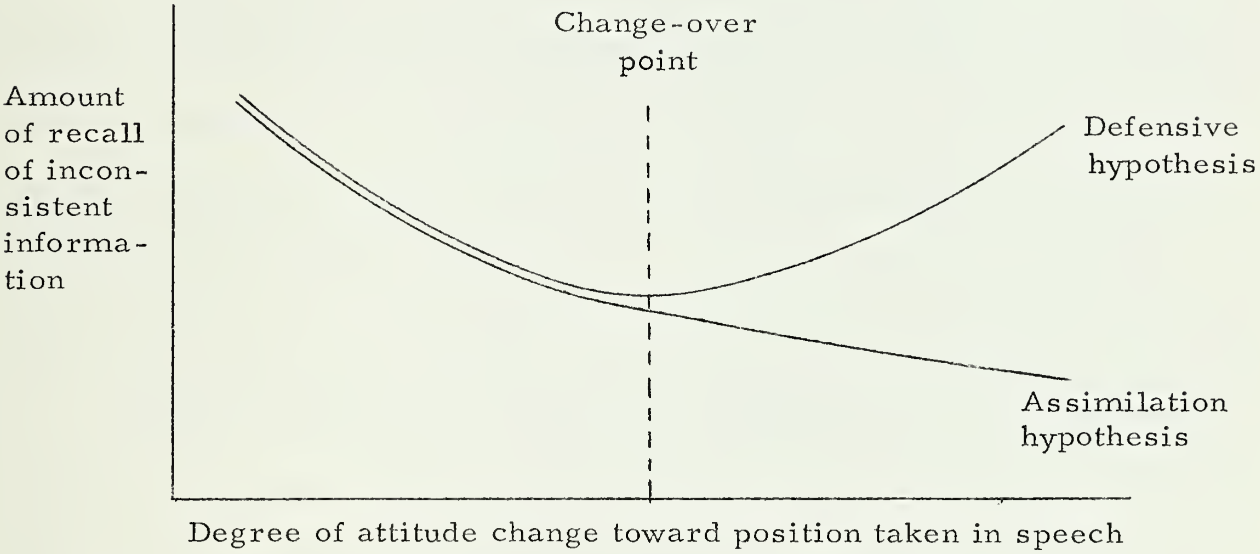

Fig. 3. Predicted functions based on two hypotheses relating attitude change to recall.

A somewhat puzzling result of the study was the failure to find an increased resistance to persuasion as a function of increased commitment. Kiesler (1971) has found this effect in several studies and considers it a defining attribute of commitment. The present study indicates that there may be some qualifications to this relation. On the one hand, subjects indicated on the manipulation check form that they did feel more committed as the manipulated commitment increased, but, on the other hand, they did not differ in their resistance to persuasion as a function of the

increase in manipulated commitment. The experimenter would be at a loss to explain the difference between the manipulation check answers and the resistance to persuasion shown by the subjects if Kiesler's notion of the relation between commitment and resistance to persuasion is correct. Perhaps there was not enough attitude change overall for the increased resistance between conditions to show up. In fact, the messages were not very persuasive since subjects changed on the average only 2.4 points on a 40-point scale. It may be that under the limiting conditions of an important issue where little persuasion occurs the increased resistance to persuasion as a function of commitment does not develop.

Another outcome of the study was a comparison of a repeated measures test of recall with a nonrepeated design. It is clear from the results that a prior retention test facilitated a subject's later recall. This facilitation may have been due to a practice effect or, possibly, anticipation of another recall test the following week. A comparison of the results of the two testing procedures leads to the conclusion that the test-retest situation, due to facilitation of later recall, may mask other effects (in this case, the A x B interaction since it was found only in the nonrepeated measures case). On the other hand, several effects were found involving the distortion and importance measures in the repeated measures design which were not found in the other testing situation. This difference may be attributable to the greater sensitivity of the repeated measures design, which is associated with the reduction in variance between the immediate

and delayed recall conditions. This reduction in variance was not so critical with respect to the amount of material recalled since there were covariates which were used to factor out some of the individual differences in recall ability. Therefore, the choice between repeated and nonrepeated recall measures may depend on which recall variables are being studied. Since retesting facilitates the amount of recall, nonrepeated measures of quantity of recall are more desirable. In the case of measures of quality, the increased sensitivity of the repeated measures may make them more desirable.

A concern was expressed in previous sections that there may have been a subject selection problem because pro subjects dropped out of the experiment more frequently when asked for higher levels of commitment. However, there was no selection problem for con subjects; and so, in all of the analyses conducted, a re-analysis with pro-con as a factor was carried out to see whether there were pro-con differences with regard to any of the obtained (or predicted) effects. In every case, there was no evidence of any such differences. Therefore, a reasonable conclusion is that subject self-selection generated by the experimental manipulation is not a viable alternative explanation for any effects obtained in the study.

One of the major attempts in the study was to develop some new ways of looking at the quality of subjects' recall in an objective manner. Thus, measures of direction-specific distortion, nondirection-specific distortion, and importance of units recalled were carefully developed and

analyzed. It cannot be claimed that the effort was fully productive, since these measures were involved in only a few effects, none of which were predicted. However, the effects observed consisted of the following:

1. Subjects distorted information more both toward and away from their own position when they were in the high commitment condition as compared to no and low commitment subjects (Table 13).
2. Subjects recalled more important ideas on the average when those ideas were consistent with their own views than when they were inconsistent.
3. Subjects who heard consistent information tended to distort it in a more radical direction as time elapsed, while subjects who heard inconsistent information tended to weaken the speech (Table 14).

None of these effects was firmly established by this one study because of the large number of exploratory tests conducted (making Type I errors very probable). Each of these effects would have to be replicated in another study before it could be accepted as reliable.

Only one other effect of interest was obtained using the new recall measures. This effect consisted of an increase in the importance of ideas recalled as time increases. In other words, subjects apparently tend to forget the less important ideas faster than important ones. This same effect was found by Johnson (1970), who originally developed the method of measuring importance.

In conclusion, the study has attempted to look at several different aspects of a subject's recall in relation to his attitude and his degree of commitment. The results cast doubt on the validity of the notion that commitment is the crucial variable in determining whether one's attitudinal position will affect the retention of controversial information. Other effects involving the relation between attitude change and recall, and involving the measures of the quality of recall, suggest directions for future research.

APPENDIX A

PRE-MEASURE ATTITUDE SURVEY

Note: Items 3, 13, 20, and 28 measure attitude towards capital punishment.

Name ______________________________

Survey

The following questions are an opinion survey. There are no right or wrong answers. We are merely interested in your opinion on a variety of current topics. Your answers are to be used for research purposes only, they will be kept completely confidential, and they will not be connected to your name. Your name is requested above only for bookkeeping purposes. Please indicate your position on each issue as accurately as you can by circling the single dot that best represents your position.

1. We should strive for loyalty to our country before we can afford to consider world brotherhood.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

2. Nobody has a right to dictate to me what I shall read.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

3. We must have capital punishment for some crimes.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

4. It would be better for the country if great fortunes were not allowed to accumulate.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

5. It is the moral duty of the individual to refuse to participate in any way in any war, no matter what the cause.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

6. The communists are a menace to this nation and to the free world in general.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

7. The enormous wealth of the extremely rich should be more uniformly distributed among all the people.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

8. I am sometimes very conscious of the presence of God.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

9. A national health insurance plan will produce a healthier and more productive population.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

10. What we need is more and better censorship of obscenity.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

11. Some races ought to be considered naturally less intelligent than others.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

12. A strong military force is necessary for the proper defense and protection of our country.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

13. Execution of criminals is a disgrace to civilized society.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

14. The only way for working people to get their rights against capitalists is through socialism.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

15. Religious faith is better than logic for solving life's important problems.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

16. A national health insurance program would be the realization of one of the true aims of a democracy.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

17. Censorship is needed because most people are unable to judge for themselves.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

18. There should be no restriction except one's own ability upon the amount of money one can honestly acquire.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

19. Any healthy individual, regardless of race or religion, should be allowed to live wherever he wants to in the world.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

20. A murderer deserves to die.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

21. There is no conceivable justification for war.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

22. Socialism is the solution to our present economic problems.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

23. I am not a religious person.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

24. Red tape and bureaucratic problems would make a national health care program grossly inefficient.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

25. Censorship can never be justified in a free country.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

26. Money or property must be held inviolate and immune to seizure by governments, even in times of war, famine, or national stress.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

27. A person can be happy and enjoy life without believing in God.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

28. I do not believe in capital punishment under any circumstances.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

29. Compulsory military training should be established in all countries.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

30. The quality of medical care under the system of private practice is superior to that under a system of compulsory health insurance.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

31. It is only the ignorant and incompetent that want socialism.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

32. Our country is probably no better than many others.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

. . . .

APPENDIX B

INSTRUCTIONS TO SUBJECTS, FIRST SESSION

Introduction

Before we start with today's session I'd like to give you some more information about the experiment. This experiment is concerned with the judged effectiveness of different styles of presenting speeches on current issues. I wanted to pick some issues that really were of current interest so I surveyed students' opinions last year and picked those topics on which opinions were pretty much evenly divided. The particular issue that you will be concerned with today is capital punishment. Apparently this is a very controversial issue on campus since there were as many people on one side of the issue as the other.

As you already know, the experiment is divided into two sessions spaced one week apart. In the first session today, I'd like for you to listen to a tape recording of a speech about capital punishment. After you listen to the tape, I'll ask you to fill out a rating form on which you'll make judgements about various aspects of the speech. The first session will be over when you complete the rating form.

When you come back next week, I'd like for you to make a brief

tape recording for me. I'm having recordings made because I really need to analyze some speeches where people use their own natural style of presentation. You won't have to make any preparations for the tape recording since the statements have already been written and you will merely have to read them from a typed manuscript. We will work on the recording together until we're both satisfied with it.

High commitment manipulation

I'm having tapes made of speeches which either definitely favor or oppose capital punishment. These tape recordings are very important since they will be used for research purposes, and they will be played as a demonstration in some fall [or spring] semester psychology classes. I think it is only fair that I tell you that you will be asked to indicate your name on the tape recording. Also, we have found in the past that, even if we tell the students who hear the tape that you didn't write the speech you are reading, they assume that the position advocated in the speech is the one you agree with. Therefore, I think it is important that I allow you to choose which speech you will read next week. I need to know what your preference is today so that I can be ready next week when you come back. So would you prefer to read the speech which opposes capital punishment or the one which favors it? [After subject picks speech, he is given consent form to sign.] Could you sign this form for me? This is a release form which gives me your permission to use the tape

recording. Please fill in the position and topic of the speech on the form to serve as a reminder to me next week. [Subject reads and signs form.] Okay, I'll have the speech favoring [or opposing] capital punishment ready for you next week.

Well, now that you know more about the experiment, let's get started with today's session. I'm going to play the tape recording over the p. a. system, so I'll go set it up now and communicate further with you from the control room. After you hear the tape I'll come back and give you the rating form to fill out. Oh, by the way, the speech you will read next week is different from the one you will hear today. We use separate speeches for the two sessions to keep them from interfering with each other.

Low commitment manipulation

I'm having tapes made of speeches which either definitely favor or oppose capital punishment. These tape recordings are very important since they will be used for research purposes. We will be analyzing the tapes on the level of the individual speech sounds to determine exactly what variations there are in natural styles of speech. Your name will not be on the recording, and after the analysis no one could recognize your voice so you don't need to be concerned that anyone will associate you with the positions advocated on the tape. Even so, I thought I should allow you to choose which speech you will read next week. I need to

know what your preference is today so that I can be ready next week when you come back. So would you prefer to read the speech which opposes capital punishment or the one which favors it? [If subject says it doesn't matter or is unimportant, experimenter tells him to pick the speech representing his own position since he will feel "more comfortable" reading it.] [After subject picks speech, he is given consent form to sign.] Could you sign this form for me? This is a release form which gives me your permission to use the tape recording. Please fill in the position and topic of the speech on the form to serve as a reminder to me next week. [Subject reads and signs form.] Okay, I'll have the speech favoring [or opposing] capital punishment ready for you next week.

Well, now that you know more about the experiment let's get started with today's session. I'm going to play the tape recording over the p. a. system, so I'll go set it up now and communicate further with you from the control room. After you hear the tape I'll come back and give you the rating form to fill out. Oh, by the way, the speech you will read next week is different from the one you will hear today. We use separate speeches for the two sessions to keep them from interfering with each other.

No commitment manipulation

I'm having tapes made of speeches on either world food problems

or the U.S. space program. These tape recordings are very important since they will be used for research purposes. We will be analyzing the tapes on the level of the individual speech sounds to determine exactly what variations there are in natural styles of speech. Your name will not be on the recording, and after the analysis no one could recognize your voice so you don't need to be concerned that anyone will associate you with the positions advocated on the tape. I thought it best to allow you to choose which speech you will read next week. I need to know what your preference is today so that I can be ready next week when you come back. So, would you prefer to read the speech on world food problems or the one on the space program? [After subject picks speech, he is given consent form to sign.] Could you sign this form for me? This is a release which gives me your permission to use the tape recording. Please fill in the position and topic of the speech on the form to serve as a reminder to me next week. [Subject reads and signs form.] Okay, I'll have the transcript on world food problems [or the U.S. space program] ready for you next week.

Well, now that you know more about the experiment let's get started with today's session. I'm going to play the tape recording over the p. a. system, so I'll go set it up now and communicate further with you from the control room. After you hear the tape, I'll come back and give you the rating form to fill out.

End of first session

[After subject hears speech, experimenter returns to room and gives him rating form. Experimenter leaves room again and returns after 1 1/2 minutes. At this point subject is either dismissed or asked to recall the speech. The experimenter checks back with subject after 10, 15, and 20 minutes, terminating recall at this point. Before subject is dismissed, he is asked not to discuss experiment with others since it could invalidate the experimental results. Subject agrees and is dismissed.]

APPENDIX C

CONSENT FORMS FOR COMMITMENT MANIPULATIONS

Form for high commitment

I agree to make a tape recording of a speech ____________________ ____________________________. In addition, I give my consent for the recording to be played in class for demonstration purposes. I have been informed that I will be identified as the person who recorded the speech.

____

Form for low and no commitment

I agree to make a tape recording of a speech ____________________ ____________________________. In addition, I give my consent for the recording to be used for research purposes with the understanding that I will not be identified as the person who made the tape recording.

____

APPENDIX D

TEXT OF SPEECH FAVORING CAPITAL PUNISHMENT

Note: Units for scoring purposes correspond to numbered sentences in the speech. Slashes within sentences correspond to further subdivision of sentence for scoring.

Pro speech

1. My work has led me to the conclusion / that it is very important to have capital punishment for certain crimes.

2. One of the principal reasons for my belief is the deterrent value of capital punishment.

3. Most murders are deliberate and calculated actions.

4. The anticipated loss of his own life is bound to make a potential murderer reconsider his actions / and refrain from taking another's life because of the harsh consequences.

5. Only a very foolish or insane person would take another's life / if it meant the eventual loss of his own.

6. It is difficult to show the deterrent effect with crime statistics gathered in areas that have capital punishment / because they invariably lack an adequate enforcement system.

7. Without an adequate enforcement system, most criminals get the feeling that they can get away with it.

8. The solution to this problem is to make the enforcement of laws more efficient.

9. If this were done, I think capital punishment would have a tremendous deterrent value.

10. The Supreme Court ruled against capital punishment in 1972 by a slim margin of 5 to 4.

11. But they did not rule that the death penalty was unconstitutional in itself / but only that it was arbitrarily applied in practice.

12. Since then at least 30 states have re-instituted capital punishment / by writing new laws which ensure that the death penalty will be fairly and equally applied.

13. The fact that so many states have felt it necessary to have the death penalty is a strong argument for its necessity in dealing with certain crimes.

14. In fact even the United States Senate recently voted to allow the death penalty for certain federal crimes.

15. Another reason I support capital punishment is that I feel that it serves the cause of justice.

16. The punishment should fit the crime / unless there are unusual or mitigating circumstances.

17. As the Bible says, "An eye for an eye."

18. Furthermore, I think that capital punishment protects society / by preventing convicted murderers from taking another human life.

19. Criminals given life sentences in states or countries without capital punishment are often paroled in a few years.

20. Since prisons rarely reform murderers / and, in fact, often produce more hardened criminals, / it is likely that they will return to a life of crime when released.

21. Statistics show that many murderers who have been released have killed again.

22. The only sure way for society to rid itself of these extremely dangerous and unreformable criminals is through a system of capital punishment.

APPENDIX E

TEXT OF SPEECH OPPOSING CAPITAL PUNISHMENT

Note: Units for scoring purposes correspond to numbered sentences in the speech. Slashes within sentences correspond to further subdivision of sentence for scoring.

Con speech

1. My work has led me to the conclusion / that capital punishment is not necessary or desirable.

2. One of the principal reasons for my belief is the lack of any proven deterrent value of capital punishment.

3. Most murders are committed in the heat of anger or in desperation.

4. The anticipated loss of his own life is not important to a murderer / because he does not have the time or ability to weigh the consequences of his act.

5. The murder is usually committed in a highly emotional state with no thought of the future in mind.

6. Crime statistics in areas that have capital punishment clearly show that it does not deter criminals.

7. In fact, murder rates are sometimes higher in these areas.

8. Apparently, even if the criminal does weigh the potential consequences of his act, he must think that he can get away with it / because he can outsmart the police.

9. This feeling of invulnerability is commonly found among criminals even when the local law enforcement system is very effective.

10. The Supreme Court ruled firmly against capital punishment in 1972 by a vote of 5 to 4.

11. They referred to capital punishment as a cruel and unusual punishment / which was arbitrarily applied in practice.

12. About 10 states have re-instituted capital punishment since that decision.

13. But it is very likely that their new laws will also be found to be unconstitutional / since the death penalty continues to be applied arbitrarily.

14. In line with these views, the United States Congress has recently rejected a bill to allow capital punishment for certain federal crimes.

15. Another reason I oppose capital punishment is that it is unjust and immoral.

16. Just as the criminal has no right to take another's life, / society has no right to take his life in return.

17. Revenge is not an acceptable motive for a modern day society.

18. Furthermore, I think that capital punishment violates the basic goals of a free and humane society.

19. Many convicted criminals have been reformed during their stay in prison / and have later become useful and contributing citizens.

20. The central concept of prison should be reform not punishment.

21. Even murderers should be regarded as maladjusted products of society / who are capable of reform if given a second chance.

22. Statistics show that most convicted murderers who are later released never commit a serious offense again.

23. Killing a criminal denies him another chance at life for a single mistake, / a harsh punishment to say the least.

APPENDIX F

SPEECH RATING FORM

Check the appropriate answer for each question.

1. How effective did you think the arguments given in the speech were?

_______ Very effective
_______ Somewhat effective
_______ Not very effective
_______ Totally ineffective

2. How effective did you think the style of presentation was?

_______ Very effective
_______ Somewhat effective
_______ Not very effective
_______ Totally ineffective

3. How competent do you feel the criminologist is who originally wrote the speech?

_______ Very competent
_______ Somewhat competent
_______ Not very competent
_______ Completely incompetent

4. Did the speaker sound sincere in his presentation?

_______ Completely sincere
_______ Somewhat sincere
_______ Somewhat insincere
_______ Completely insincere

5. Were the arguments presented by the speaker clearly formulated and developed?

_______ Very much so
_______ Somewhat
_______ Not very well
_______ Not at all

6. Do you agree with the statements in the speech?

_______ Agree with all
_______ Agree with most
_______ Agree and disagree with some
_______ Disagree with most
_______ Disagree with all

APPENDIX G

RECALL FORM

Please try to recall, to the best of your ability, all of the taped speech that you heard. You do not have to recall all the material in the exact same words, but please do your best to recall the complete text. Use both sides of this paper and additional sheets, if necessary. The order of statements is not important; just record the ideas as you remember them.

APPENDIX H

INSTRUCTIONS TO SUBJECT, SECOND EXPERIMENTAL SESSION

The first thing I'd like for you to do today is fill out the rating form again. I'd like to know what your opinions are after a week's time. [Subject is given rating form to fill out.]

Next, I'd like for you to recall the speech you heard last week. Please try to recall as much as possible. [Subject is given recall form. Experimenter leaves the room and returns after 7, 10, and 15 minutes. If subject is not finished after 15 minutes, recall is terminated.]

As it turns out, I won't need for you to make the tape recording we talked about last week. Instead, I'd like for you to help me evaluate some material for future sessions of the experiment and to fill out a few forms for me. Okay? [Subject agrees to continue.] First, I'd like for you to read the following passage which I may be using in future sessions. After you've read it I'll ask you some questions about it. [Subject is given copy of neutral passage to read and allowed to read it through once.]

Of course, you realize that the speech you heard last week is very

controversial material. I'm trying to find some material which is almost completely neutral in tone to use as a control condition in other sessions of the experiment. By neutral I mean material which is factual and non-controversial and which doesn't arouse much emotion when you read it. I thought this passage was a good possibility for that type of material but wanted to get other people's impressions. What did you think of it in these terms? [Subject discusses passage with experimenter for short period of time.]

I'd also like for you to fill out an opinion survey for me. This is the same survey I mentioned before that I used last spring [or fall] to help select issues for the experiment. Because this is a different class and group opinions on current issues tend to change over time, I need to have people fill out this survey again to help validate the work I'm doing. So if you don't mind would you please indicate your position on the issues in this survey? [Subject is given copy of post-measure survey and fills it out.]

Next, I'd like for you to answer a few brief questions about the experiment. Please indicate your feelings on these questions. [Subject is given manipulation check form.]

There is one more thing I'd like for you to do and then the experiment will be over. Would you please try to recall the neutral passage about the stars that you just read? [Subject is given paper and pencil to use in recalling speech. Experimenter leaves room and checks back in

5, 7, and 10 minutes. Recall is terminated after 10 minutes.]

[Subject is completely debriefed at this point and asked not to discuss experiment with others.]

APPENDIX I

TEXT OF NEUTRAL PASSAGE USED AS MEASURE OF RECALL ABILITY

Note: Slashes in speech indicate division into scoring units.

No matter where one travels on the earth, there are familiar guideposts in the sky. / As one travels east and west, there is little change overhead except in time. / As one goes north and south, many changes occur overhead. / Sun and stars climb the sky / and new ones come into view, / or the sun and moon appear lower in the sky as new stars climb into view. / From the position of the stars it is possible to tell your geographic position. /

The Polynesian sailor navigates the trackless ocean without sextant or radio. / He watches birds and cloud formations, / but he is largely dependent on the sun and stars. / Some of their remarkable feats of sailing are very hard to understand unless you realize that Polynesians make excellent use of navigation stars. /

There are tales of these sailors making their way between islands in the Pacific that are separated by hundreds or even thousands of

miles. / Only a few degrees of error in steering their course would have caused them to miss their target by many miles / and perhaps have perished at sea. /

Early sailors and traders on the Mediterranean Sea also learned to use the stars to navigate precisely between ports in Europe and Africa. / Since they were very dependent on the night-time sky, sailors invented names for many star groups to make identification of various guidepost stars easier. / They even made up elaborate myths to explain the origins of the star groups. /

The most significant star for navigation has always been the North Star / since it remains relatively fixed in the night sky / while the rest change position due to the earth's rotation. / However, because of small changes in the earth's axis of rotation over thousands of years / the star that the ancients called the North Star is not the same as the one we use to find a northern direction. / In another thousand years, yet another star will be a better guide to the North / than the star, Polaris, is for us now. /

APPENDIX J

POST-MEASURE ATTITUDE SURVEY

Note: Items 5, 10, 15, and 23 measure attitude towards capital punishment.

This survey is to be used for research purposes only. We are interested in your opinion on a variety of issues. Please indicate your opinion by checking the scale beneath each item.

1. I believe that children should be bused to achieve racial balance in the schools.

Agree Strongly					Neither Agree nor Disagree					Disagree Strongly
(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)

2. Abortion is technically the same as the murder of an unborn child.

Agree Strongly					Neither Agree nor Disagree					Disagree Strongly
(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)

3. We should have public financing of campaigns.

Agree Strongly					Neither Agree nor Disagree					Disagree Strongly
(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)

4. The public should not be allowed easy access to some drugs because of their danger.

Agree Strongly					Neither Agree nor Disagree					Disagree Strongly
(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)

5. I do not believe in capital punishment under any circumstances.

Agree Strongly					Neither Agree nor Disagree					Disagree Strongly
(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)

6. Welfare should not be paid to those who take advantage of the system.

Agree Strongly					Neither Agree nor Disagree					Disagree Strongly
(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)

7. Abortion should be illegal except in extreme cases.

Agree Strongly					Neither Agree nor Disagree					Disagree Strongly
(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)

8. Children should attend only the schools in their local district.

Agree Strongly					Neither Agree nor Disagree					Disagree Strongly
(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)

9. We should legalize all drugs.

Agree Strongly					Neither Agree nor Disagree					Disagree Strongly
(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)

10. Execution of criminals is a disgrace to civilized society.

Agree Strongly					Neither Agree nor Disagree					Disagree Strongly
(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)

11. We should not pay anyone welfare who can work for a living.

Agree Strongly					Neither Agree nor Disagree					Disagree Strongly
(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)

12. I think the present campaign financing system is inadequate.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

(.) (.) (.) (.) (.) (.) (.) (.) (.) (.) (.)

13. Politicians are unduly influenced by those who contribute heavily to their campaigns.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

(.) (.) (.) (.) (.) (.) (.) (.) (.) (.) (.)

14. The laws concerning drug use should be liberalized.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

(.) (.) (.) (.) (.) (.) (.) (.) (.) (.) (.)

15. We must have capital punishment for some crimes.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

(.) (.) (.) (.) (.) (.) (.) (.) (.) (.) (.)

16. We should permit abortions only during the first three months of pregnancy.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

(.) (.) (.) (.) (.) (.) (.) (.) (.) (.) (.)

17. Busing to achieve racial balance will inevitably lead to an improvement in the educational system.

Agree Strongly					Neither Agree nor Disagree					Disagree Strongly
(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)

18. The present welfare system should be replaced with a guaranteed minimum income.

Agree Strongly					Neither Agree nor Disagree					Disagree Strongly
(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)

19. Only drugs that have proven to be harmless should be made legal for use by everyone.

Agree Strongly					Neither Agree nor Disagree					Disagree Strongly
(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)

20. Women should have the right to obtain an abortion any time they so desire.

Agree Strongly					Neither Agree nor Disagree					Disagree Strongly
(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)

21. Segregation in the schools is not necessarily bad.

Agree Strongly					Neither Agree nor Disagree					Disagree Strongly
(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)

22. I believe that the present welfare system is grossly inadequate.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

(.) (.) (.) (.) (.) (.) (.) (.) (.) (.) (.)

23. A murderer deserves to die.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

(.) (.) (.) (.) (.) (.) (.) (.) (.) (.) (.)

24. The taxpayers should not have to bear the burden of financing political campaigns.

Agree Strongly	Neither Agree nor Disagree	Disagree Strongly

(.) (.) (.) (.) (.) (.) (.) (.) (.) (.) (.)

APPENDIX K

MANIPULATION CHECK QUESTIONNAIRE

Please answer the following questions by checking the answer which best expresses your feelings.

1. Were the instructions given by the experimenter clear and concise?

    _______ definitely
    _______ somewhat
    _______ not very
    _______ not at all

2. Who did you think would hear the tape recording that you were going to make today?

    _______ students in some psychology classes
    _______ other subjects in the experiment
    _______ researchers who would analyze the style of speech
    _______ no one but the experimenter

3. Did you think that other people who heard this tape recording might recognize you and assume the position advocated in the speech was your own?

    _______ thought this was very likely
    _______ thought this was likely
    _______ thought this was unlikely
    _______ thought this was very unlikely

4. Did you feel that you were taking a public stand on the capital punishment issue by agreeing to make the tape recording?

    _______ felt this strongly
    _______ felt this somewhat
    _______ felt this very slightly
    _______ did not feel this at all

APPENDIX L

INSTRUCTIONS TO RATERS WHO JUDGED STATEMENTS IN CAPITAL PUNISHMENT SPEECHES FOR IMPORTANCE

Note: Instructions were accompanied by three copies of the speech.

Please read through these directions completely before starting.

The passage on the attached sheets is composed of *22* sentences. As in any written material, some of these sentences are less important in their contribution to the effectiveness of the complete message than others. In other words, some of the sentences could be eliminated without greatly changing the meaning or effectiveness of the passage, but other sentences are important enough that their absence would substantially alter the message. We are trying to develop a way to measure the relative importance of each sentence. You can help us by spending a few minutes on the following task.

You will find three copies of the passage attached to these directions. On the *1st copy*, please cross out (draw a line through) the *6* sentences that you feel are *least important* to the overall effectiveness of the passage. (Please use a pencil so that you can make changes if necessary.)

After you finish crossing out 6 sentences, please turn to the *2nd copy* and cross out the *same* sentences *again*. Then, proceeding in a similar manner, cross out an additional *6* sentences that you consider to be the least important of the remaining sentences. At this point you should have drawn a line through a total of *12* sentences on *copy 2*.

Next, turn to the *3rd copy* and draw a line through the *12* sentences which were eliminated on *copy 2*. You should have *10* sentences remaining at this point. Finally, cross out *5* of the remaining sentences on the 3rd copy so that you have only the *5* *most important* ideas *left* when you are through.

Please try to make your judgments of importance independent of your personal feelings about capital punishment. In other words, try to judge the sentences objectively and don't eliminate a sentence just because you disagree with it.

The passage represents a speech that was used in an experiment dealing with the effects of attitude on memory, and it does *not* necessarily give the true facts about capital punishment.

APPENDIX M

IMPORTANCE RATINGS FOR UNITS IN CAPITAL PUNISHMENT SPEECHES

Table 19

Frequency Distribution of Importance Ratings and Modal Ratings for Statements in Speech Against Capital Punishment (Number of raters = 21)

Statement Number	Rating Categories				Modal Rating
	1	2	3	4	
1	1	3	3	14	4
2	1	3	7	10	4
3	4	9	5	3	2
4	10	6	3	2	1
5	9	5	5	2	1
6	3	0	7	11	4
7	9	8	4	0	1
8	11	5	5	0	1
9	9	8	3	1	1
10	5	2	8	6	3
11	3	4	10	4	3
12	7	10	3	1	2
13	7	11	1	2	2
14	8	6	7	0	1
15	3	4	7	7	3
16	4	5	6	6	3
17	6	5	5	5	1
18	3	2	11	5	3
19	3	11	5	2	2
20	2	3	4	12	4
21	9	7	3	2	1
22	4	6	6	5	3
23	5	4	4	8	4

Table 20

Frequency Distribution of Importance Ratings and Modal Ratings for Statements in Speech for Capital Punishment (Number of raters = 23)

Statement Number	Rating Categories				Modal Rating
	1	2	3	4	
1	4	1	3	15	4
2	3	5	1	14	4
3	13	6	3	1	1
4	3	8	5	7	2
5	20	2	1	0	1
6	1	7	11	4	3
7	11	6	4	2	1
8	1	12	7	3	2
9	18	4	1	0	1
10	0	4	15	4	3
11	3	8	6	6	2
12	0	4	16	3	3
13	5	13	3	2	2
14	12	7	2	2	1
15	2	5	1	15	4
16	2	10	6	5	2
17	20	2	1	0	1
18	3	6	1	13	4
19	2	10	10	1	2
20	7	7	5	4	2
21	6	5	7	5	3
22	2	5	6	10	4

APPENDIX N

DATA SUMMARY TABLES

Table 21

Scores on Manipulation Check Questions

Degree of Commitment		Immediate Recall		Delayed Recall	
		Consistent Information	Inconsistent Information	Consistent Information	Inconsistent Information
High					
Question 1[a]	M[b]	3.40	4.00	3.20	3.30
	SD[c]	.96	0	1.13	1.25
Question 2	M	2.30	2.50	1.90	3.10
	SD	.67	.85	.88	.57
Question 3	M	2.40	2.10	1.60	1.90
	SD	.97	.74	.97	.74
Low					
Question 1	M	2.10	2.40	2.10	2.00
	SD	1.10	.70	.57	.68
Question 2	M	1.60	1.60	1.20	1.00
	SD	.52	.70	.42	0
Question 3	M	1.30	1.60	1.50	1.30
	SD	.67	.70	.71	.67
No					
Question 1	M	2.20	2.30	2.10	2.10
	SD	.92	.67	.74	.57
Question 2	M	1.40	1.10	1.40	1.30
	SD	.70	.32	.70	.67
Question 3	M	1.30	1.00	1.10	1.00
	SD	.67	0	.32	0

Note. Scores range from 1 to 4 with higher scores reflecting a higher degree of expressed commitment.

[a] Question 1 refers to second question in Appendix K; question 2 is third question; and question 3 is last question.

[b] Mean of scores in cell.

[c] Standard deviation of scores in cell.

Table 22

Recall Scores (Nonrepeated Measures)

Degree of Commitment		Immediate Recall		Delayed Recall	
		Consistent Information	Inconsistent Information	Consistent Information	Inconsistent Information
High					
Measure 1	M	161.70	182.80	134.10	137.60
	M_{adj}[a]	168.10	173.67	135.67	127.03
	SD	58.88	56.36	53.91	60.97
Measure 2	M	13.30	16.60	8.90	10.70
	M_{adj}	13.87	16.02	8.94	10.24
	SD	5.33	4.22	3.21	3.86
Measure 3	M	.110	.062	.132	.085
	M_{adj}	.117	.064	.129	.099
	SD	.188	.293	.507	.160
Measure 4	M	.529	.386	.565	.393
	M_{adj}	.517	.395	.565	.392
	SD	.182	.132	.268	.150
Measure 5	M	2.49	2.37	2.50	2.57
	M_{adj}	2.49	2.38	2.50	2.58
	SD	.30	.23	.35	.17
Low					
Measure 1	M	198.10	181.50	132.40	119.20
	M_{adj}	196.38	171.69	128.44	120.99
	SD	86.42	66.49	86.74	52.14
Measure 2	M	17.40	14.70	9.30	9.80
	M_{adj}	17.33	14.67	8.74	9.86
	SD	5.44	4.64	3.74	3.82
Measure 3	M	.102	.039	.099	.095
	M_{adj}	.105	.073	.085	.091
	SD	.129	.301	.339	.321
Measure 4	M	.403	.426	.437	.399
	M_{adj}	.402	.410	.453	.402
	SD	.182	.173	.247	.303
Measure 5	M	2.52	2.44	2.62	2.62
	M_{adj}	2.52	2.45	2.62	2.62
	SD	.20	.18	.55	.41

Table 22--Continued

		Immediate Recall		Delayed Recall	
Degree of Commitment		Consistent Information	Inconsistent Information	Consistent Information	Inconsistent Information
No					
Measure 1	M	215.30	201.60	97.00	92.50
	M_{adj}	213.28	213.52	106.86	98.16
	SD	51.64	58.70	36.86	40.90
Measure 2	M	20.30	16.90	7.20	6.40
	M_{adj}	19.97	17.24	7.87	6.74
	SD	3.74	3.93	2.86	1.43
Measure 3	M	.117	.140	.301	.247
	M_{adj}	.107	.114	.299	.245
	SD	.154	.200	.318	.427
Measure 4	M	.385	.394	.523	.610
	M_{adj}	.394	.404	.514	.604
	SD	.086	.135	.179	.221
Measure 5	M	2.37	2.25	2.40	2.57
	M_{adj}	2.37	2.24	2.39	2.57
	SD	.14	.21	.30	.36

Note. Measure 1 = number of words; Measure 2 = number of ideas; Measure 3 = amount of direction-specific distortion; Measure 4 = amount of nondirection-specific distortion; Measure 5 = importance of ideas.

[a] Mean adjusted for three covariates.

Table 23

Recall Scores (Repeated Measures)

		Immediate Recall		Delayed Recall	
Degree of Commitment		Consistent Information	Inconsistent Information	Consistent Information	Inconsistent Information
High					
Measure 1	M	-	-	116.20	157.90
	M_{adj}	170.72	172.47	123.85	149.78
	SD	-	-	51.94	36.80
Measure 2	M	-	-	10.20	13.40
	M_{adj}	14.09	15.86	10.98	12.72
	SD	-	-	4.96	4.14
Measure 3	M	-	-	-.099	.121
	M_{adj}	.115	.064	-.125	.150
	SD	-	-	.267	.429
Measure 4	M	-	-	.556	.507
	M_{adj}	.513	.403	.536	.524
	SD	-	-	.250	.186
Measure 5	M	-	-	2.66	2.46
	M_{adj}	2.48	2.38	2.62	2.49
	SD	-	-	.48	.19
Low					
Measure 1	M	-	-	145.60	142.00
	M_{adj}	196.06	171.99	144.17	137.58
	SD	-	-	59.96	49.31
Measure 2	M	-	-	12.20	11.10
	M_{adj}	17.33	14.81	12.05	11.52
	SD	-	-	4.61	4.72
Measure 3	M	-	-	.088	.134
	M_{adj}	.100	.079	.091	.158
	SD	-	-	.294	.314
Measure 4	M	-	-	.357	.428
	M_{adj}	.403	.428	.353	.418
	SD	-	-	.156	.181
Measure 5	M	-	-	2.61	2.49
	M_{adj}	2.53	2.44	2.62	2.46
	SD	-	-	.28	.29

Table 23--Continued

Degree of Commitment		Immediate Recall		Delayed Recall	
		Consistent Information	Inconsistent Information	Consistent Information	Inconsistent Information
No					
Measure 1	M	-	-	178.40	142.90
	M_{adj}	212.29	217.33	175.02	152.54
	SD	-	-	52.77	55.32
Measure 2	M	-	-	15.40	12.20
	M_{adj}	19.85	17.26	14.79	12.44
	SD	-	-	3.44	5.01
Measure 3	M	-	-	.061	.192
	M_{adj}	.100	.111	.068	.155
	SD	-	-	.217	.254
Measure 4	M	-	-	.426	.394
	M_{adj}	.392	.384	.435	.401
	SD	-	-	.121	.167
Measure 5	M	-	-	2.43	2.37
	M_{adj}	2.38	2.24	2.46	2.38
	SD	-	-	.22	.20

Note. Means and standard deviations in immediate recall condition are given in Table 22. See Table 22 for explanation of measures 1-5 and of M_{adj}.

Table 24

Attitude Toward Capital Punishment Both Before and After Experiment

Degree of Commitment		Immediate Recall: Consistent Information	Immediate Recall: Inconsistent Information	Delayed Recall: Consistent Information	Delayed Recall: Inconsistent Information
High					
Pre-measure[a]	M	15.00	16.20	16.20	16.10
	SD	3.43	3.73	3.26	3.45
Post-measure	M	14.70	11.80	15.90	14.70
	SD	5.48	6.09	5.20	5.10
Low					
Pre-measure	M	16.30	14.90	17.40	15.00
	SD	3.71	3.87	2.87	3.97
Post-measure	M	17.10	11.60	18.20	13.20
	SD	2.60	6.88	2.97	5.01
No					
Pre-measure	M	16.80	14.90	14.10	16.50
	SD	2.78	3.60	3.75	3.47
Post-measure	M	14.60	14.70	13.30	13.00
	SD	6.13	4.81	5.89	7.21

Note. Higher scores reflect stronger attitudes either for or against capital punishment.

[a] Pre-measure is given in Appendix A; post-measure in Appendix J.

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